4th CINEC INTERNATIONAL RESEARCH SYMPOSIUM PROCEEDINGS (CIRS) - 2023

Industry, Innovation, and Inclusion: The 21st Century Way Forward

"Tirer Parti de L'excellence"

- Leveraging Excellence –

CINEC CAMPUS
Beyond A Graduate

18th January 2024

CINEC Campus, Malabe

Sri Lanka

Proceedings

Faculty of Humanities & Education

CINEC Campus, Malabe

January 2024

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Beyond A Graduate

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Preface

The 4th CINEC International Research Symposium (CIRS) is organized and hosted by The Faculty of Humanities and Education at the CINEC Campus in Malabe, Sri Lanka. The event will take place on January 18, 2024, at the CINEC Klaus E Orlendorff main auditorium. CIRS, the Annual International Research Symposium 2023 encompasses the theme of "Industry, Innovation and Inclusion: The 21st Century Way forward", which resonates the pressing need to introduce innovative strategies and concepts that embrace progressive thinking and informed adaptation to industry, aligning with the dynamic globalized era of the 21st century.

CIRS 2023 features national and international research abstracts categorized under six sub themes reflecting the central theme emphasizing the vision "Tirer partir de Excellence"- Leveraging Excellence in all academic fields.

Track 1 Faculty of Marine Engineering Faculty of Maritime Sciences	"Sailing Through Dynamic Challenges with Knowledge and Discipline Toward Excellence and Superiority"
Track 2 Faculty of Engineering and Technology	"Inclusive Engineering: Driving Sustainable Impact"
Track 3 Faculty of Computing	"Innovation & Invention"
Track 4 Faculty of Management and Social Sciences	"Empowering Tomorrow's Leaders: Industry Innovation and Inclusion - The 21st Century Way Forward at the Faculty of Management & Social Sciences"
Track 5 Faculty of Health Sciences	"Inclusive Industry Transformations: Driving Innovation Through the Dissemination of Scientific Knowledge"
Track 6 Faculty of Humanities and Education	"Employing current trends in Humanities and Education for sustainable development through innovation and inclusion"

A heartfelt tribute to all the faculty staff and the representatives of CINEC; Faculty of Management and Social Sciences, Faculty of Engineering and Technology, Faculty of Computing, Faculty of Health Sciences, Faculty of Science, Faculty of Maritime Sciences, Faculty of Marine Engineering, Faculty of Humanities and Education. Their dedicated contributions were crucial in making CIRS 2024 a resounding success. A special thanks also goes to all the talented presenters and participants for the diverse scholarly realms unravelled through the two concurrent panel discussions of the CIRS on the 18th of January 2024.

We all stood as one, united, striving for the vibrant purpose of ensuring the symposium to inspire the intellectual capacities, while adding to the treasure house of the Academic scholarship, providing a priceless opportunity for university students of both national and international scope.

Organizing Committee
04th CINEC International Research Symposium

Message from the President of CINEC Campus
Capt. Ajith Peiris

4th CINEC International Research Symposium (CIRS) -2023
CINEC Campus, Malabe, Sri Lanka

It is an honor and great pleasure to convey the message to the 4th CINEC International Research Symposium 2023 (CIRS 2023), hosted by the Faculty of Humanities and Education. I would like to thank and congratulate all researchers from Sri Lanka and other countries who presented and shared their knowledge with us at CIRS 2023.

"Industry, innovation and inclusion: The 21st Century Way forward" the theme of this year's symposium is very timely to contribute to 17 Sustainable Development Goals (SDG) with education being 4th SDG which is a worldwide call to action to eradicate poverty, safeguard the climate and environment, and guarantee that everyone can live in peace and prosperity.

The Faculty of Humanities and Education has been able to convince society of the valuable academic contribution of this endeavor by organizing the 4th CINEC International Research Symposium.

It is significant to mention that, CINEC as a leading higher education institute, with this 4th consecutive year of the CIRS, has extended national recognition and provides a platform to all state and non-state sectors to present their research work which could generate new knowledge or contribute to existing knowledge. Further CIRS 2023 not only helps to strengthen knowledge and skills, but it also gives opportunity to network within the research communities.

I am certain that all participants will benefit immensely from the acquisition and advancement of knowledge, networking with a diverse range of stake holders, and contributing to the development of appropriate national policies and strategies to achieve the intended goals.

While wishing all the participants best wishes with their future endeavors, I would like to extend my thanks and appreciation to the Faculty of Humanities and Education for making the 4th CINEC International Research Symposium 2023 (CIRS 2023) a great success.

Capt. Ajith Peiris
President
CINEC Campus, Malabe,
Sri Lanka

Message from the Senior Consultant / Academic and Research of CINEC Campus

Dr. Ajith Madurapperuma

Dear Participants,

I am thrilled to extend this message to the abstracts book of the Student Symposium hosted by our esteemed institution. This symposium serves as an exceptional platform for our students to exhibit their remarkable achievements across a wide spectrum of subjects and disciplines. The dedication and enthusiasm our students have invested in their work are truly commendable.

The significance of this symposium is manifold. Firstly, it serves as a means for the dissemination of knowledge. Additionally, it acts as a forum where our students can celebrate their intellectual curiosity. Moreover, it functions as a launchpad for potential future scholars, researchers, and intellectual leaders. Through their projects, our students have exhibited their willingness to engage in meaningful discussions, seek innovative solutions, and explore new frontiers of knowledge.

I encourage all those who were able to present their work in this forum, as well as those who couldn't due to various reasons, to seize this opportunity to nurture a culture of research and innovation for the betterment of society. Continue to foster connections among your peers and with external entities that can support your future endeavors.

I would like to express my deep gratitude to the organizing committee, our dedicated faculty mentors, and all those who have worked tirelessly to make this event a reality. Your unwavering commitment to nurturing the academic growth of our students is truly invaluable.
I wish each and every one of you a successful and enriching experience at the CINEC Campus Student Symposium.

Dr. Ajith Madurapperuma

The Senior Consultant / Academic and Research

CINEC Campus, Malabe,
Sri Lanka

Message from the Symposium Chair
Mr. Lasantha Basnayake
Associate Dean/ Senior Lecturer
Faculty of Humanities and Education

I warmly welcome you to the 4th CINEC INTERNATIONAL RESEARCH SYMPOSIUM-2023, the Annual Conference of the CINEC CAMPUS. With a record number of participants expected this year, we are delighted to see that these annual conferences are becoming larger and more substantial every year. I am equally excited about the record number of sessions, and the wide variety of ideas that scholars and practitioners will bring into our field. The theme for this year's conference is, "Industry, Innovation and Inclusion: The 21st Century Way forward", which I firmly believe to be timely. I hope that this conference will allow the participants a productive discourse not only in managing academic objectives, but also in managing operations in the industries of other sectors.

Essentially, the purpose of this symposium is to **share and exchange valuable information.** From these discussions, different recommendations or solutions can be developed since this allows experts from a specific topic to gather together and discuss the topic in question and examine the problems and different trends regarding the theme.

This conference would not be possible without generous help from the entire staff of CINEC and many other people. I am truly grateful to the Program Co-Chair, Ms. Veronica Kurukulaarachchi, the members of the Faculty of Humanities and Education and other faculties of CINEC for the energy and thoughts that they have invested in organizing the program. I am thankful to the conference organizing committee members, the track chairs, the session chairs, and the numerous volunteers, without whose generous contributions this conference would not have set another new record number of presentations and number of participants. We also appreciate the cadre of sponsors supporting this conference. Most of all, I thank you, the participants, for enriching these annual conferences by your presence. I hope you will enjoy

the content, renew old friendships, make new friends, get new ideas, and above all, have a good time.

The hard work and dedication of all the members of organizing, scientific, technical, and financial committees during the preparation for this conference is highly appreciated. Without them the event would not have been possible. Thanks, and acknowledgement are due to the logistics and secretary for their support and continuous follow up, that makes it a successful event. The broad scope of this event, which includes humanities and education, engineering and technology, health sciences, management, and social sciences, maritime, information technology and science provide a unique meeting ground for researchers spanning the whole spectrum of respective disciplines. I hope that some fruitful collaborations can be established while sharing knowledge through this conference. In addition, the theme of the conference "Industry, Innovation and Inclusion: The 21st Century Way forward" is a much appropriate and timely choice.

Finally, I must congratulate the organizing committee of CIRS-2023 on the successful completion of the event, and I extend my best wishes to all national and international presenters on their outstanding achievement.

Mr. Lasantha Basnayake
Associate Dean/ Senior Lecturer
CINEC Campus, Malabe,
Sri Lanka

Message from the Dean - Faculty Marine Engineering.

Mr. Arjuna Ranasinghe

It is with great pleasure and excitement that I extend my warmest congratulations to the participating students, all members of our esteemed campus and other participants in the prestigious occasion of the student international Symposium of the CINEC Campus in 2023. This symposium, scheduled for 18th of January 2024, aims to provide a platform for the exchange of knowledge, ideas, and experiences across various disciplines. As we come together to celebrate the diverse talents and achievements within our campus, this event promises to be a catalyst for intellectual growth and collaboration.

Our theme for this year's symposium is **"Industry Innovation & Inclusion: The 21st Century Way Forward".** The symposium serves as a dynamic platform for scholars, professionals, and thought leaders to explore, discuss, and propel the discourse on the transformative potential of industry innovation and the crucial role of inclusion in shaping our collective path forward in the 21st century.

This comprehensive volume captures the essence of our shared endeavors, featuring a diverse array of research papers, presentations, and insights from contributors who have passionately delved into the intricacies of modern industry dynamics. From groundbreaking technological advancements to strategies for fostering inclusivity, each contribution reflects a commitment to advancing knowledge and a drive for positive change.

The Marine Engineering faculty is centered around the theme **"Sailing Through Dynamic Challenges with Knowledge and Discipline Toward Excellence and Superiority. "**In a world marked by constant change and evolving challenges, our ability to navigate these dynamic waters depends on the acquisition of knowledge and the cultivation of discipline. This

symposium serves as a beacon for our community, guiding us towards excellence and superiority in the face of the ever-shifting landscape of academia and beyond.

Reflecting our commitment to fostering innovation, critical thinking, and interdisciplinary dialogue, we have curated a lineup of distinguished speakers, panel discussions, and interactive sessions that will inspire and challenge our perspectives. The symposium is not only a platform for academic enrichment but also a celebration of our collective achievements. It is an occasion for us to come together, appreciate the diversity of our academic pursuits, and build connections that will contribute to the growth and success of CINEC Campus community.

I look forward to your enthusiastic participation in making this year's Symposium a resounding success. Let us embrace this opportunity to learn, collaborate, and celebrate the spirit of intellectual curiosity that defines our campus. Thank you for your invaluable contributions to the CINEC International Research Symposium 2023. May the insights shared within these pages continue to inspire and guide us as we navigate the ever-evolving landscape of industry and inclusion in the 21st century.

Mr. Arjuna Ranasinghe

Faculty Marine Engineering

CINEC Campus, Malabe,
Sri Lanka

Message from the Dean, Faculty of Management and Social Sciences

Prof. Lalith Edirisinghe

I am delighted to send a congratulatory message to the CINEC International Research Symposium 2023/4 that will be held on the 18th of January 2024 at CINEC Campus Malabe. The symposium theme namely, "Industry Innovation & Inclusion: The 21st Century Way Forward" is a timely topic.

CINEC has a rich tradition of fostering academic excellence, and this conference is a testament to our commitment to intellectual discourse and collaboration. The diverse range of topics and disciplines represented here reflects the interdisciplinary nature of modern academia, and I am confident that the exchange of ideas on this day will be both stimulating and enlightening. I would like to express my gratitude to the organizing committee for their hard work and dedication in putting together this remarkable event. Their efforts have ensured a program that encompasses a broad spectrum of innovative research and provides a platform for meaningful discussions.

To all the peers and participants, I encourage you to actively engage in the sessions, network with your peers, and take advantage of the opportunities to forge new collaborations. It is through such interactions that we can create lasting impacts on our respective fields and contribute to the betterment of society.

I wish everyone a productive and enjoyable conference experience. May this day be filled with intellectual inspiration, fruitful discussions, and the forging of connections that will endure beyond the confines of this event.

Warm regards,

Professor (Dr) Lalith Edirisinghe

Dean, Faculty of Management and Social Sciences

Expert Consultant to the United National Secretariat

Head, Technology Transfer of the World Bank project

Message from the Dean - Faculty of Maritime Sciences

Capt. Prasanna Sedrick

On behalf of the Faculty of Maritime Sciences, I am happy to send this message to the organizing committee and participants of the CINEC International Research Symposium 2023 Proceedings on the theme "Industry Innovation & Inclusion: The 21st Century Way Forward" from the Faculty of Humanities and Education. It is heartening to see the interest generated by students and staff in compiling over 350 abstracts, which keeps CINEC Campus ahead in research on the varied topics, as well as in higher education.

This international Symposium gives new opportunities to make the maritime field better known to the stakeholders with the experiences shared by the contributors in this sector which carries well over 80% of global international trade.

With the frequently changing dynamics of sea transport affected by global and regional politics, resulting in seafarers carrying out their duties under constant threat to their lives and in certain high-risk areas, requiring protection given by the international maritime forces.

Maritime topics will generate a new interest in this annual CINEC International Research Symposium (CIRS), and I wish the presenters who wish to share their knowledge, to be able to create an effective impact on the decision makers at both national and international level, considering that the Indian Ocean and Sri Lankan ports are of strategic importance to the more powerful nations. I wish all those, both the academic and non-academic staff, who worked tirelessly to make this happen, a very successful and impactful symposium.

Capt. Prasanna Sedrick

Faculty of Maritime Sciences

CINEC Campus, Malabe,
Sri Lanka

Message from the Dean - Faculty of Engineering & Technology
Dr. Janaka Liyanagama

The CINEC International Research Symposium returns, and this year, we stand at the precipice of a transformative era. Our theme, "Industry, Innovation, and Inclusion: The 21st Century Way Forward", resonates deeply as we navigate the evolving landscape of progress. The Faculty of Engineering and Technology sets its eye on envisioning "Inclusive Engineering: Driving Sustainable Impact" in this year's symposium and it gives me immense please to forward this message with warm wishes for a successful event.

From its emerging days, CIRS has championed sustainable development, ensuring all voices are heard. Today, we proudly stride alongside the United Nations' Sustainable Development Goals, not just through academic precision, but by fostering a vibrant ecosystem of diverse research disciplines. This symposium transcends formal education, becoming a place where knowledge and imagination converge, forging practical solutions for a brighter future.

Through the years, CIRS has established itself as a premier platform for collaboration. Industry leaders and academic personalities congregate, igniting transformative dialogues and translating cutting-edge research into tangible applications, witness ground-breaking ideas take flight in insightful panel discussions, propelling us toward a future where technological advancements benefit all.

The international recognition garnered by CIRS is a testament to our unwavering commitment to excellence. It fuels our ambition to empower Sri Lanka's stakeholders, fostering knowledge exchange and forging collaborative partnerships. This symposium is more than just an

academic event; it is a catalyst for change, a platform to shape national policies that drive our engineering and IT sectors into the heart of the 21st century.

To the esteemed presenters, organizers, and every individual who breathes life into CIRS, our deepest gratitude. Let us join hands, make this symposium a resounding success, and demonstrate the unparalleled power of industry, innovation, and inclusion in shaping a future for all.

Dr. Janaka Liyanagama
Faculty of Engineering & Technology
CINEC Campus, Malabe,
Sri Lanka

Message from Associate Dean- Faculty of Computing
Ms. Suranji Nadeeshani

It is a great pleasure to send this message as Associate Dean of Faculty of Computing for the 4th International Research Symposium (CIRS). This student symposium has become the most important academic event at CINEC Campus. It's a moment of pride for all staff members of the Faculty of Computing to see the academic achievements of their students.

This is a great opportunity for the students of the CINEC Campus to disseminate their knowledge gained throughout their academic journey. It will help them to improve their skills not only in research but also presentation skills, teamwork, communication skills, creativity, and organizational skills. I firmly believe the outcomes of this 4th International Research Symposium will be productive and greatly support the professional development of participants and national development too.

Finally, I would like to appreciate the efforts of all members of the organizing committee who have worked hard and contributed to the success of the symposium. I wish all the very best for all presenters and participants for a great event!

Dr. Suranji Nadeeshani
Faculty of Computing
CINEC Campus, Malabe,
Sri Lanka

Message from the Dean - Faculty of Health Sciences

Senior Prof. Menik Hettihewa

I am greatly esteemed to issue this message to the symposium proceedings considering the participating students, staff, and all other symposium participants at the prestigious occasion of the student international research symposium in 2023 at CINEC. This event has become an inevitably important occurrence for the Faculty of Health Science in CINEC Campus to participate during this inspiring time for almost all undergraduates to showcase their research findings.

As the Dean of the Faculty, I strongly believe that convincing students for dissemination of the research knowledge is part of our academic duties. Therefore, annual student research symposium of the CINEC Campus was specially organized with the theme of, Technology push with society change; reframing health society relationship for this special forum in year 2022.

In 2023, CINEC Student research symposium had become uplifted to international standards, and it has become the only event to disseminate the research outcome of all the final year projects to the public for its use in product identification, property protection or commercialization. Experiences which will be gained by all the students and staff in this exposure, will be immensely helpful for establishing partnerships with relevant industry and revitalize their research and application skills for future challenges.

Quality of the research abstracts were maintained through standard reviewing protocols by the experts in the related fields in health. As the Dean of the Faculty of Health Sciences, I am exultant to see the students' and staffs' enthusiasm to prepare and present their research work by learning all research methods, data analytical methods ethical applications while they are doing their academic program even before they start their final year projects.

I would like to make my special tributes to the keynote speaker, for accepting our invitation to grace this occasion. I would like to express my sincere gratitude to the all sponsors who had contributed to this event on our invitation. Organization of a research symposium in this calibre in this challenging era, is not an easy task. Therefore, I wish to thank all the members of the organization committee for their efforts to uphold this event in line with international standards.

Senior Prof. Menik Hettihewa

Faculty of Health Sciences
CINEC Campus, Malabe,
Sri Lanka

Message from the Dean - Faculty of Humanities and Social Sciences

Dr. Sujeewa Polgampala

As the Dean of the hosting faculty of Humanities and Education, I am pleased and enthusiastic to extend a warm welcome to the Fourth International Research Symposium on "Industry, Innovation, and Inclusion: The 21st Century Way Forward". This symposium recognizes the rapidly changing world by building resilience towards resistance by leveraging digital transformation for sustainable growth and success through innovation. As we gather to exchange ideas, explore new perspectives, and engage in meaningful discussions, I am confident that this symposium will serve as a platform for intellectual growth and the cultivation of innovative solutions to the challenges we face in today's world.

I am confident that this symposium stipulates a unique opportunity to showcase your latest findings, share insights, and build connections with fellow researchers who share our passion for discovery. Throughout the symposium, I encourage you to actively participate in the various sessions, engage in thought-provoking conversations, and establish connections that could lead to fruitful collaborations.

Remember, it is through the collective efforts of the research community that we can make meaningful contributions to our respective fields and society as a whole. I want to thank the team of reviewers, who did a superb job selecting high-quality papers to be presented at the conference. As we all know, organizing this kind of event on an annual basis is not an easy task. My profound thankfulness goes to the Associate Dean, the Head of the Department, the Assistant Head of the Department, and all the lecturers and staff for their critical roles in

edifying research culture while reaffirming our unwavering commitment to promoting education through a new trajectory.

Your dedication and hard work have laid the foundation for an inspiring and intellectually stimulating symposium. My great accolades to all the presenters for their professional success. Let us embrace the spirit of collaboration, curiosity, and discovery as we embark on this exciting journey together.

Dr. Sujeewa Polgampala
Faculty of Humanities and Social Sciences
CINEC Campus, Malabe,
Sri Lanka

Plenary Session: Panel Speakers

Dr. Vivimarie Vanderpoorten
Senior Lecturer, Former Head
Department of Language Studies
Open University of Sri Lanka
Gratiaen Award winning Poet.

Dr. Ajith Madurapperuma
Consultant, Research and Academic affairs
Open University of Sri Lanka

Dr. Janaka Liyanagama
Dean, Faculty of Engineering & Technology

Prof. Lalith Edirisinghe,
Dean, Faculty of Management & Social Sciences

Capt. Peshala Medagama
Vice President Maritime Affairs, International Cooperation and Foreign Projects / Senior Lecturer
CINEC Campus

Senior Prof. Menik Hettihewa
Dean, Faculty of Health Sciences

Mr. Lasantha Basnayake
Associate Dean, (Moderator)
Faculty of Humanities and Education

Dr. Sujeewa Polgampala
Dean, Faculty of Humanities and Education

FACULTY OF MARINE ENGINEERING
&
FACULTY OF MARITIME SCIENCES

"Sailing through dynamic challengers with knowledge and discipline towards excellence and superiority"

TECHNICAL SESSION – 01

Capt. Peshala Medagama

Session Chair
Vice President
Maritime Affairs, International Cooperation and Foreign Projects / Senior Lecturer
CINEC Campus

Mr. Arjuna Ranasinghe

Panel Member
Dean / Senior Lecturer
Faculty of Marine Engineering
CINEC Campus

Capt. Prasanna Sedrick

Panel Member
Dean / Senior Lecturer
Faculty of Maritime Sciences
CINEC Campus

FACULTY OF ENGINEERING AND TECHNOLOGY

"Inclusive Engineering: Driving Sustainable Impact"

Civil Engineering Electrical and Electronics

Prof. Ruwan Weerasekara
Chair
Department of Civil
Engineering
Faculty of Engineering and
Technology
Cinec Campus
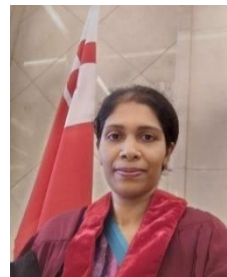
Dr. (Ms.) U.S.Premaratne
Senior Lecturer
Department Electrical
and computer
engineering
Faculty of Engineering
Technology
Open University Sri Lanka

Dr. Sampath Hewage
Lecturer
Department of Civil
Engineering
Faculty of Engineering
University of Moratuwa

Mr. Srimal Punchihewa
Senior Lecturer
Department of
Electrical and
Electronic
Engineering

C.Eng.Pramodh Alwis Manager
Projects and Facilities
Management
Aitken Spence Logistics

Mr. Ganesh Kumar
R&D Enineering Divor
Automation (Pvt) Ltd

Mechanical and Automotive Engineering

Dr. Charita Darshana Makavita
Chai
Senior Lecturer
Department of Mechanical Engineering,
University of Sri Jayewardenepura

C.Eng. Ravith Silva
Chairman,
Automobile Industry Council

Mr. Geethal Siriwardana
Lecturer
Department of Mechanical Engineering
University of Sri Jayewardenepura

Mr. Asiri Manchanayaka
Head of Department, Department of Mechanical
and Automotive Engineering,
Faculty of Engineering and Technology,
CINEC Campus

Faculty of Computing

"Innovation & Invention"

Ms. Maduwanthi Uthpala
Session Chair
Lecturer
Faculty of Computing

CINEC Campus-Malabe

Ms. Varuni Rajapakse
Lecturer
Faculty of Computing
CINEC Campus- Malabe

Ms. Vijini Mekala
Lecturer
Sri Lanka Institute of Advanced Technological Education

Faculty of Management and Social Science

"Empowering Tomorrow's Leaders: Industry Innovation and Inclusion - The 21st Century Way Forward at the Faculty of Management & Social Sciences"

Technical Session 01

Ms. Anushka Gunawardana
(Panel Member)
Program Coordinator   Assistant Head of the Department
Faculty of Management and Social Sciences
Senior Lecturer
CINEC Campus - Malabe

Ms. Malinthi Jayawardena
(Panel Member)
Lecturer in Banking and Finance
Program Coordinator
Department of Management and Business Studies Faculty of Management and Social Sciences CINEC Campus- Malabe

Ms. Poojani Rangana
(Panel Member)
Lecturer in Logistics and Transport
Department of Logistics and Transport
Faculty of Management and Social Sciences
CINEC Campus- Malabe

Mr. Sumithra Nandana Kumara
Lecturer in Management
Department of Management and Business Studies Faculty of Management and Social sciences
CINEC Campus- Malabe

Faculty of Management and Social Science

"Empowering Tomorrow's Leaders: Industry Innovation and Inclusion - The 21st Century Way Forward at the Faculty of Management & Social Sciences"

Technical Session 02

Ms. Dilhani De Silva
Lecturer/ MBA Program Coordinator
Department of Management and
Business Studies
Faculty of Management and Social
Sciences
CINEC Campus - Malabe

Ms. Avanthi Madawattage
Lecturer
Department of Logistics and Transport Faculty of Management and Social sciences CINEC Campus- Malabe

Ms. Irosha Ariyarathne
Lecturer in English
Department of Management and
Business Studies
Faculty of Management and
Social Sciences
CINEC Campus - Malabe

Ms. Jayani Rajakaruna
Lecturer in Information technology Department of Management and Social studies Faculty of Management amd Social sciences CINEC Campus - Malabe

Faculty of Health Sciences

"Inclusive Industry Transformations: Driving Innovation Through the Dissemination of Scientific Knowledge"

Prof. Sameera R Samarakoon

Plenary Speaker

Professor

Institute of Biochemistry, Molecular Biology and Biotechnology,

University of Colombo

Sri Lanka

Technical Session 01

Senior Prof. Menik Hettihewa
Session Chair
Dean/Senior Professor
Faculty of Health Sciences,
CINEC Campus

Dr. Malinda Badaturu
Panel Member
General Manager-
Quality Operations
Astron Limited

Technical Session 02

Prof. Sameera R Samarakoon Professor
Institute of Biochemistry, Molecular Biology and Biotechnology University of Colombo

Dr. Kalpani Ratnayake
Panel member
HOD/Senior Lecturer
Department of Cosmetic Science
Faculty of Health Science
CINEC Campus

Technical Session 01

Ms .Suhashini Marian Silva
Panel member
HOD/Senior Lecturer
Department of Biomedical Sciences
Faculty of Health Science

Technical Session 02

Dr. K.G.P. Wasana

Panel member
Senior Lecturer
Department of Health and Medical Sciences
Faculty of Health Sciences
CINEC Campus

Faculty of Humanities and Education

"Employing Current Trends in Humanities and Education for Sustainable Development through Innovation and Inclusion"

Department of English

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The Dean of Department of
English Language Teaching
The Buddhist and Pali
University of Sri Lanka

Dr. Sujeeva Sebastian Pereira
(Session Chair)
Senior Lecturer
Department of English and
Linguistics
University of Sri
Jayawardenepura

Mr. Sameera Jayawardene
(Panel Member)
Senior Lecturer
Department of English
Language Teaching
University of Sri
Jayewardenepura

Mr. Deepal Warnakulasuriya
(Panel Member)
Visiting Lecturer
University of Sri Jayawardenepura
Newa Operation Manager ART
Television

Ms. Chathuni Jayaweera
(Panel Member)   Lecturer
Department of English
Faculty of Humanities and
Education
CINEC Campus

Ms. Kalani Dissanayake
(Panel Member)   Lecturer
Department of English
Faculty of Humanities and
Education
CINEC Campus

Faculty of Humanities and Education

"Employing Current Trends in Humanities and Education for Sustainable Development through Innovation and Inclusion"

Technical Session of Department of Education

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(Session Chair)
Dean
Faculty of Humanities and Education
CINEC Campus

Dr. Gayanthi Wadanambi
(Panel Member)
Senior Lecturer Grade I
The Head of Department
Department of Education
Faculty of Humanities and Education
CINEC Campus

Mr. Camilus Grero
(Panel Member)
Senior Lecturer
Faculty of Humanities and Education
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Modeling and Simulation of a Digital Temperature Control System using Thermocouple and Solid-State Relay (SSR)

R.M.U.G.H. Himalsha[#], _N.A.D Kumararathne, and K.P.R Heshan_

Department of Marine Electrical Engineering, Faculty of Marine Engineering, CINEC Campus, Malabe, Sri Lanka

hashanhimalsha2001@gmail.com

Abstract

This study presents the design, development, and simulation of a digital temperature control system utilizing a practical model comprising a thermocouple, a digital temperature controller, and a Solid-State Relay (SSR) for heating element switching. The objective of this study is to create a comprehensive practical model that accurately regulates and maintains a desired temperature set point through the integration of modern control components. The system's architecture involves the integration of a thermocouple sensor for real-time temperature sensing, a digital temperature controller for precise set point adjustment, and an SSR for efficient switching of the heating element. The thermocouple provides accurate temperature measurements, serving as the primary input for the digital temperature controller. The digital temperature controller employs advanced control algorithms to compute the necessary adjustments to maintain the temperature close to the set point. Furthermore, the SSR facilitates rapid and precise switching of the heating element, resulting in improved temperature response times and energy efficiency. The integration of these components enables the system to efficiently and accurately regulate temperature, making it suitable for various applications where precise temperature control is essential. Also, this helps to study about measurement errors, control strategies like ON/OFF and PID and necessary alarming conditions.

Keywords:Digital temperature controller, Solid stare relay, thermocouple, ON/OFF control, PID control

Modeling of Long-Distance Analog Signal Transmission using 4-20mA Current Loop for PT-100 Sensor Measurements

R.M.U.G.H Himalsha[#], T.H.S Sanjana, and T.A.D.L.D Alwis

Department of Marine Electrical Engineering, Faculty of Marine Engineering, CINEC Campus, Malabe, Sri Lanka

hashanhimalsha2001@gmail.com

Abstract

The demand for accurate and reliable signal transmission in industrial automation and process control systems has led to the widespread adoption of the 4-20mA current loop as a preferred method for transmitting analog signals over long distances. This study focuses on the comprehensive modeling of long-distance analog signal transmission utilizing a 4-20mA current loop, specifically for the measurement of temperature using a 3-wire PT-100 sensor. The integration of a PT-100 sensor to 4-20mA converter and a digital indicator completes the signal transmission chain. This study begins by developing a model by selecting the 4-20mA current loop as the chosen transmission method, highlighting its major advantages such as robustness against noise, ease of implementation, and suitability for long-distance communication. Furthermore, this model delves into the assessment of limitations and potential challenges that might arise during the practical implementation of the modeled system. Strategies for minimizing signal degradation and enhancing the overall reliability of the transmission system can be discussed, including noise filtering, shielding techniques, and calibration procedures.

Keywords: Analog signal transmission, 4-20mA current loop, PT-100 sensor, signal degradation, calibration

Automation and Optimization of Marine Shell and Tube Type Heat Exchangers

H.D.N.D Premathilaka[#], J.M.A.L.D Perera, A.C.P.M Amarathunga, L.L.D.N Alwis, H.G.P Dabare,

J.M Kahandakorala, Y.C Perera, A.M.P.D Amarasinghe, L.A.D Kumara, M.N.S Perera

Department of Marine Engineering, Faculty of Marine Engineering, CINEC Campus, Malabe, Sri Lanka.

hdndnrwn@gmail.com

Abstract

Marine industries heavily rely on heat exchangers for efficient heat transfer between fluids. The most common type used is the Shell and Tube Heat Exchanger (STTHE). While STTHEs offer modifiability and cost-effectiveness, they often require manual control and maintenance. This paper proposes the automation and optimization of STTHEs in marine applications. A prototype is built to test the proposed system, using solenoid valves, pumps, and sensors. The design incorporates a closed-loop system with water reservoirs, allowing controlled testing. Electrical wiring and safety features, such as circuit breakers, are included to ensure safe operation. The system is tested for three days, simulating real-world conditions. Data is collected, and the system's performance is analyzed. Successful automated operation without alarms indicates the feasibility of automating STTHEs. Automation can revolutionize the marine industry by reducing manual labor, enhancing safety, and optimizing maintenance practices. Moreover, this automation concept can be extended to other critical machinery on ships, potentially leading to the development of Safe Unmanned Ships.

Keywords: Heat Exchanger Automation, Marine Efficiency Enhancement, Condition-Based Maintenance, Control System Integration, Sensor-Based Optimization.

Enhancing Energy Efficiency and Freshwater Generation in Fully Automatic On-Board Systems Using AI Technology

G.E.M.N.N Ekanayake[#], D.P.P Perera, E.M.B.S.B Ekanayake, C.N Waththuhewa, A.N.C.S Mirando, K.A.C.K Gunarathne, G.N.D.T.D Premathilake, L.A.D. Kumara, M.N.S. Perera

Department of Marine Engineering, Faculty of Marine Engineering, CINEC Campus, Malabe, Sri Lanka.

nenuka2002@gmail.com

Abstract

Freshwater generator in a vessel is an indispensable machinery which converts sea water into potable water. Pursuit of amplifying the efficiency of the freshwater generator plant opens up to a wide range as the evolvement of the modern technology takes place in marine industry. This abstract explores a critique about how the freshwater generator plant in a ship can be fully automated and intensified using the modern technologies and substitutions of equipment. Automation of the freshwater generator necessitates the integration of advanced control systems, sensors, and machine learning algorithms to optimize freshwater production, energy consumption, and maintenance scheduling. By automating key operations, such as feed water intake, brine ejection, and demister cleaning, operators can enhance operational efficiency, reduce human intervention, and ensure consistent water quality. These abstracts highlight the challenges and common liabilities of the current freshwater generator and how automating it can be beneficial as the efficiency increases prevailing the complexities. These appliances collectively improve efficiency, safety and sustainability within the marine industry.

Keywords: Freshwater generator, potable water, efficiency, automation, sensor, human intervention, sustainability, machine learning algorithms

An Overview of the Law of the Sea defined by UNCLOS

G.A.I. Gorokgahagoda [#], W.M.D.K.V. Wijesinghe, A.P.S.D. De Silva, D.D. Mayadunna, N.A. Diyunuge, R.W.M.C.R. Rodrigo, G.K.K.S.S. Samarasinghe, M.A.C.D. Weerasinghe, LA.D. Kumara, M.N.S. Perera

Department of Marine Engineering, Faculty of Marine Engineering, CINEC Campus, Malabe, Sri Lanka.

aparnaeset@gmail.com

Abstract

This research comprehensively analyzes the United Nations Convention on the Law of the Sea (UNCLOS) and its profound impact on international maritime law. It begins by tracing the historical evolution of maritime legal principles and delves into UNCLOS's core objectives. The article examines key provisions, including maritime boundaries, territorial seas, and innocent passage. Exclusive Economic Zones (EEZs) are explored, along with the complexities of overlapping zones. Continental shelf jurisdiction, deep seabed mining, environmental conservation, and dispute resolution mechanisms within UNCLOS are discussed. The article evaluates the delicate compromises within UNCLOS, balancing state property rights over EEZs with equitable resource sharing as the "common heritage of mankind." It scrutinizes how fisheries agreements affect developing nations and proposes policy amendments. Deep-sea mining's ecological concerns and the role of the International Seabed Authority in regulation are probed. Managing overlapping EEZs and potential conflicts is emphasized, highlighting UNCLOS-prescribed resolution procedures. The article addresses challenges posed by rising sea levels to fixed baselines and suggests adaptive strategies for equitable maritime boundaries. In conclusion, the article offers an extensive overview of UNCLOS as a pivotal legal framework shaping international maritime law and relations. It navigates ocean governance dynamics, emphasizing ongoing debates, challenges, and opportunities to enhance UNCLOS for responsible resource management, environmental preservation, and global cooperation.

Keywords: UNCLOS, Law of the Sea, Maritime boundaries, Exclusive Economic Zones (EEZs), Environmental conservation

Risk Perceptions and Risk Management in Maritime Vessels: Seafarers' Perspectives

A. W. Karunatilleke #

Doctorate Student from the Faculty of Commerce and Management, University of Kelaniya, Sri Lanka.

awkarunatilleke@gmail.com

ORCID 0000-0002-5828-7468

Abstract

The Colombo Harbor tugboat operations are a very important business and process of Colombo Port. The shipping industry's most recent demands for tug performance have facilitated an array of new designs and technologies. Operational requirements for tugboats are constantly expanding, with high expectations for the reliability and efficiency of vessels. Authorities and offshore terminal operators also require increased availability of escort and offshore terminal tugs to assist ever larger ships, which frequently operate in severe weather conditions, during monsoon weather in Sri Lankan waters. The work that tugs and tow boats carry out is inherently risky. However, the risks can be managed and reduced with proper care and effective practice, the purpose of this research is to examine the present situation in the shipping industry with regard to these risks and their handling. The industry is investigated to determine the most critical risk factors seafarers (persons working onboard vessels) are facing today of vessels with propulsion plants less than 750Kw, and to understand the tools and strategies used in handling these risks. The study used an exploratory qualitative research methodology that relies on semi-structured interviews. The sample consists of 20 interviews covering seafarers of various ranks such as captains/chief engineers working on board tug boats. This study contributes to the literature on redefining and realigning risk management perceptions and strategies within the shipping industry. Finally, recommendations have been made for future understanding.

Keywords: Marine Tugs, Maritime Risk Management, Safety, Shipping, Strategy, Seafarers

COLREGSs misunderstood?

Shane Sannkaranarayana[#1], Thilak Sydney Wickramasinghe[2]

Department of Navigation, Faculty of Maritime Sciences[1], Department of Navigation, Faculty of Maritime Sciences [2]

<shane@cinec.edu>

Abstract – Safety and Shipping Review of 2022 states that, number of global maritime accidents/incidents from 2012 to 2021 have been mainly caused by machinery damage or failure (9,968), followed by collision (3,134), contact (2,029), piracy (1,995) and fire/explosion (1,747). As the risk of collisions at sea are still high, objective of this research is to identify whether there are difficulties in understanding and the application of International Regulations for Preventing Collisions at Sea (COLREGs) 1972, by watchkeeping officers working onboard cargo ships. Total number of 76 Accident investigation reports of cargo ships involving navigating officers (OOW), issued between 01/01/2012 to 31/12/2021. Collisions occurred when masters were at the con on both the vessels are excluded from this research. 80% of the collisions could have been avoided had one vessel was aware the presence of the other. Highest number of collisions had taken place in cases of crossing situations. Further, it is also important to note that 52% of the OOWs involved in collisions were sufficiently experienced. No evidences were found to conclude it is the misinterpretation or misunderstanding of COLREGs by OOWs onboard cargo ships that had led to these accidents, but obviously the wrong application of it. As most of the collisions had occurred with an experienced OOW, this could have been due to complacency and/or over confidence of his part. As corrective measures stake holders shall consider Motivating OOWs to comply with the SMS and COLREGs, use RADAR and ARPA in determining if risk of collision exist and to use Trial manoeuvres when deciding on suitable action to take, broadly addressing about the overconfidence and complacency, making it compulsory to use automatic acquisition zone on the ARPA, and adopting a methodology to warn the master or nominated officer if pre-set CPA and TCPA cannot be maintained with the targets plotted on ARPA.

Keywords: Ship, Collisions, COLREG

Level of Environmental Awareness of the students of Maritime Vocational Sector in Sri Lanka

P.A.S.A. Rathnasri[#1] E.A.K.K. Amarasekara[1] D.D.D. Suraweera [2]

Department of Coastal and Marine Resource Management, Ocean University of Sri Lanka[1], Department of Electrical and Electronics Technology, University of Vocational Technology[2]

shamalir@ocu.ac.lk

Abstract-Knowledge about the environment and our interactions with it is crucial to make informed decisions. The purpose of the present research is to evaluate the environmental awareness of students pursuing maritime vocations in Sri Lanka to better inform policy decisions being made about maritime vocational education standards. This research is based on a survey of 237 students engaging in maritime vocational training in state and private institutes from January to April 2022. The survey is a descriptive survey design with a voluntary sampling method and structured questionnaire. The questionnaire was prepared in English, Sinhala and Tamil and consists of 25 closed ended or multiple-choice questions and one open-ended question, Responses were collected either by post or from visiting institutes. Data was analyzed using Minitab 18 and Microsoft Excel 365. The survey revealed that most students have an overall general level of environmental awareness. More than 50% of the participants had correct answers for 11 out of 12 general environmental knowledge questions with at least 50% correct from each course category. There was an overall awareness about global warming, its causes, and consequences. Participants had a good understanding of the consequences of oil pollution, with over 80% of participants from all course categories giving correct answers for all 10 questions. However, there is still room for improvement about environmental conservation attitudes with only a less than 15% of participants being well aware of the existing laws and regulations regarding environmental protection and conservation, and most participants not being satisfied with the role of the government and other institutes. 97.5% of participants were willing to make themselves aware of the environment and were mostly attracted to awareness programs, while 58% of people were not willing to pay to learn about the environment. It is suggested to develop a module including all critical aspects of environmental knowledge and current environmental issues to be included in the course curricular.

Key words – Maritime Education, Vocational Training Sector, Environmental Awareness.

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Design and Development of a Cost-Effective Interconnected Control System for Electric Two Wheelers

A Sasitha Sujani Eldeniya[1]

Faculty of Engineering and Technology, CINEC Campus, Malabe, Sri Lanka

sashiel1998@gmail.com

Abstract - This research presents a study on the design and development of a low-cost integrated control system for electric two-wheelers. This research focuses on understanding the vehicle's mechanical parameters such as dynamics, kinematics, statics as well as the electrical components such as battery, battery management system, motor, motor controller and the display to design the control system and to ensure the cost effectiveness, optimization as well as the safety and efficiency of the two-wheeler.

The Pugh Matrix Analysis, which is also a decision matrix, has been utilized to evaluate the cost effectiveness and prioritize the alternatives of the control system. The Simulink modelling has been employed to model the control system and to validate the theorical calculations of the designed control system. The system is integrated, allowing communication between different components and resulting in a smoother and more efficient operation. The findings of the study offer an insight into creating a cost-effective, efficient, and safe interconnected control system for electric two-wheelers.

This research is significant as the market for electric two-wheelers is growing, and there is a need for developing innovative solutions to enhance their performance and safety. The proposed integrated control system can potentially reduce the cost of production while increasing the vehicle's efficiency and safety.

Keywords: Control system, Interconnected, Optimisation, Cost effective, Simulink

Bilge Sensor Testing Device for an Uncrewed Ship

Ayantha Dhanushka Silva[1] and Colin Field[2#]

Department of Mechanical Engineering, Faculty of Engineering, University of Wolverhampton
[2]Marine remote system lead, Ocean Infinity

[#]colin.field@oceaninfinity.com

Abstract - Bilge well is a crucial part of a ship that provides an idea about the flooding status in an engine room. ARMADA 78 m vessels are fully uncrewed robotic ships with or without seafarers. Therefore, the main objective of this study is to design and assess a bilge well sensor testing device to predetermine the condition of the bilge well in an engine room in an autonomous ship. To design the device, Aluminum was selected as the building material. Tungsten inert gas welding was used to connect the aluminum tray and extended arms together. The two-way valve piston was modified to indicate the position of the piston in the top dead center and the bottom dead center with two infrared sensors. The anterior side of the piston would pass through a spring located inside the cylinder. Therefore, during the uplift, the piston was shifted by compressing the spring. Five port four-way valve was fixed into the system to activate and control the flow direction of the compressed air to the air piston. The arrangement was tested from the fluid sim pneumatic software (Version 6.1). A conductivity meter was calibrated to identify the different conductivities of seawater, freshwater, and diesel oil, in the bilge well. The software was designed to indicate the position of the air piston, the condition of the bilge sensor, and the type of fluid in the bilge well. After operating the device, it has indicated the same values as the standard conductivity values for freshwater, seawater, and for diesel. During the different bilge well conditions, this instrument recognized the water or oil conductivity and signaled an alarm. In conclusion, this device helps to identify the bilge well condition in a fully autonomous ship, can prevent engine room flooding and allows to check the floating bilge well sensor.

Keywords: Bilge well, Engine room flooding, Uncrewed ships

Design and Fabrication of a Rattan Splitting Machine for Efficient Production of High-Quality Rattan Material

L. S. S. Wijewickrama [1], A.G. S. J. Abeawardhana[2], A. B. D. M. Silva[3], Ishan Virantha[4]

Department of Mechanical and Automotive Engineering, Faculty of Engineering and Technology, CINEC Campus Malabe, Sri Lanka.

hiruwijewickrama@gmail.com   shanilkaabeawardhana@gmail.com   dshanmsilva@gmail.com

Abstract – Rattan is a versatile material used in the production of various furniture and handicrafts. However, the rattan splitting process, which involves manually splitting rattan rattans into thinner strips, can be time-consuming and labor-intensive. To address this issue, a rattan splitting machine has been designed to develop this process using mechanical Technology. The rattan splitting machine features a durable blade that splits rattan rattans into thin strips of equal width, reducing the need for manual labor. The design of the machine is compact and efficient, with adjustable settings that can be tailored to accommodate different rattan sizes and thicknesses. The machine is powered by electricity or compressed air, making it easy to operate and maintain. The use of the rattan splitting machine can greatly improve the productivity and efficiency of the rattan industry, while also reducing the physical strain on workers. With this machine, manufacturers can produce rattan products in larger quantities and at a faster pace, while ensuring consistent and high-quality outputs. Overall, the rattan splitting machine is a valuable tool for the rattan industry, offering a convenient and efficient solution for the rattan splitting process. Its ability to automate the process can result in increased productivity and profitability, while reducing the manual labor required.

Keywords: Automate, Productivity and profitability, Rattan, Splitting process, Versatile material.

Bio Diesel Production in Home Environment and Evaluating Copper Corrosion and Lubricity Performance

K G A I Dharmasiri[#1]

Faculty of Engineering and Technology, CINEC Campus, Malabe, Sri lanka[1]

ashanisurangabro@gmail.com

Abstract – Homemade biodiesel production is a growing field of interest for environmentally-conscious individuals seeking to reduce their carbon footprint and dependence on fossil fuels. Biodiesel is a renewable fuel that can be made from a variety of sources, including vegetable oil, animal fats, and waste cooking oil. The production process involves a chemical reaction known as transesterification, which converts the oil into biodiesel. This paper is to explore the production of bio diesel and how bio diesel react with copper and test the lubricity by conducting a pin on disk test. the advantages of homemade biodiesel include reduced emissions, lower costs, and increased self-sufficiency. However, the process can be complex and requires careful attention to detail in order to produce a quality product. Due to the fact that production of bio diesel not standardize in Sri Lanka and all productions are homemade, even though bio diesel is produced Sri Lankan using various oils and lipids reacting with various reactants, there is no quality control in the home production processes and no testing for the products quality. Thus, arising a doubt in consumer's mind where it is safe to use. This identified as a problem. In this study the aim is to produce several homemade bio diesel samples which are produced in home environment with different raw materials and produced under same conditions, and subject them in to test procedures and evaluate on how they behave under a copper corrosion test and testing for lubricity performance by pin on disk test. The production of homemade biodiesel has the potential to be a sustainable and environmentally-friendly solution for individuals seeking to reduce their carbon footprint and contribute to a cleaner planet. In conclusion this research was aimed at production homemade bio diesel samples which are produced in home environment with different raw materials and produced under same conditions, and subject them in to test procedures and evaluate on how they behave under a copper corrosion test and testing for lubricity performance by pin on disk test. which was achieved at the end of the research.it is safe to say that bio diesel produced from Methanol – KOH and Methanol – NaOH can be used in engines as an alternative fuel without thinking that they would corrode copper components and fuel line in fuel system and wear from this bio diesel fuel is similar to the wear of diesel fuel. Bio diesel made from KOH and propanol performed less comparing to other samples.

Keywords: Homemade, Bio Diesel, Pin on disk test, copper corrosion test.

3D Printer Filament Making Machine Using Recycled Plastics

Mohamed Azad Haroon

Department of Electrical and Electronics Engineering, Faculty of Engineering.

harunmazad@gmail.com

Abstract - The emergence of 3D printers has revolutionized the plastic industry by enabling to create customized and complex objects. The raw material used to the printer is the filament. The traditional production of printing filament relies on the Virgin plastics, this is a direct impact to environmental pollution. This can be reduced by making the filaments using recycled plastics. The innovative objective is recycling the plastic and making 3D printer filament at the single stage processing. The aim is to reduce the plastic wastage and conversion of plastic into products. There is a certain methodology for this process such as collecting the waste plastic sorting out shredding and extruding. Since the collected plastic will be in various categories, we should sort, such this machine design to recycle PE and PP type thermoplastic. Next, they will be shredded separately and then finally fed to the machine. This machine consists of extruder, water bath, water cooling tower, gauge meter and winder. The extruder consists of screw and barrel where the barrel will be heated using heater element to get required heat. The plastic fed to the machine will flow through the barrel with aid of the screw. This melted plastic ejecting from the extruder will flow into the water bath to cool down and get the wire shape when it gets winded in a uniform speed. The gauge meter between the winder and the water bath will give us the diameter reading of the filament which is being winded. The diameter of the filament can be adjusted by adjusting the winding speed and the flow rate of the extruder. The water-cooling tower is used for cool down the water in water bath. In conclusion, the 3D printer filament making machine utilizing recycled plastics represents a promising environmentally friendly filament production. Further research and developing will enhance to produce more ecofriendly 3D printer filaments.

Keywords: Extruder, Elements, Filament, Thermoplastic.

Thermoelectric Peltier AC Units Using P-N Semiconductor Elements

Deminda Nesith

Department of Electrical and Electronics Engineering, Faculty of Engineering.

nesith2002@gmail.com

Abstract – In pursuit of a sustainable and efficient cooling solution, this research investigates the development of a thermoelectric Peltier air conditioning (AC) unit utilizing P-N semiconductor elements. The aim is to enhance cooling efficiency, affordability, and environmental friendliness. The present study outlines the research problem of high-energy consumption and limited cooling efficiency associated with conventional AC units, leading to increased environmental impact and costs. The objectives encompass the design and fabrication of a novel thermoelectric Peltier AC unit that integrates P-N semiconductor elements, exploiting their inherent heat transfer properties. Methodologically, a prototype AC unit is developed and tested, with comprehensive experimental procedures to evaluate its performance. In conclusion, the research presents a pioneering approach to AC cooling technology by integrating P-N semiconductor elements, yielding significant improvements in efficiency (Depend on Airflow and the heat exchange throw the P-N semiconductor), affordability (1/2 price of traditional AC system), and environmental sustainability (0 pollution). The findings have broader implications for sustainable cooling solutions and pave the way for the implementation of advanced thermoelectric systems in various applications.

The environmental friendliness of the system is highlighted by its low energy consumption and reduced reliance on harmful refrigerants.

Keywords: ECO-cooling, Thermoelectric AC unit, P-N semiconductor elements, Sustainability, ECO friendly

Analysis of Ascertaining the Suitability of Transmitting Stations for the Valley Areas of Western Province in Sri Lanka

Taniya Madushani Pathirana #1 and *Pubudu Rupasinghe* #2

Department of Electrical and Electronic Engineering, CINEC campus 1, Department of. Electrical and Electronic Engineering, CINEC campus 2

taniyamadushani7@gmail.com

Abstract – The utilization of the analog terrestrial television platform holds a significant presence within Sri Lanka. The escalating demand for an elevated standard of television transmission quality within this province has triggered the commencement of an unparalleled and distinctive research initiative. The fundamental objective of this comprehensive study is to meticulously evaluate the compatibility and applicability of European boundary curves, harmonized with the stipulations outlined by the International Telecommunication Union (ITU), as a strategic measure to redress the prevalent issues. The assessment of the adequacy of the prevailing transmission station located in Matugama and Avissawella was undertaken through an analysis involving detailed profile drawings and a field strength survey conducted at the site. In response to the shortcomings of the current transmission stations, novel repeater stations were devised to surmount these limitations. The novel repeater station was suggested by deeply analyzing aspects such as transmitter specifications, power requirements, lightning protection, and cost optimization. To address the novelty of this research, calculations were executed, and field strength values were derived for both Very High Frequency and Ultra High Frequency ranges from European broadcasting union curves, and subsequently subjected to comparison. In summation, the outcome of the field strength analysis resolutely ascertained that the European Broadcasting Union curves, in their existing form, do not align harmoniously with the intricate contextual dynamics presented by the television transmission landscape in Sri Lanka.

Keywords: Transmission Station, Field Strength, European Broadcasting Union Curves, International Telecommunication Union

Convolution Neural Network Based Improved Algorithm for Sri Lankan Currency Recognition and Counterfeit Banknote Detection

Mudalige Kavindu Ransara[#1], A.A Hashini Vindya Athauda[#2]

Department of Electrical & Electronics Engineering, CINEC Campus, Malabe, Sri Lanka

kavindumudalige5@gmail.com

Abstract – In the modern, circulation of counterfeit banknotes in society has increased when compared to the past 10 years. Circulation of counterfeit banknotes directly affects the economy. The worst thing that can happen to the economy is increasing inflation due to the circulation of high amounts of counterfeit money in society. Printing fake money is one of the oldest crimes in the world. Nowadays Counterfeiters have switched from the conventional offset printing approach, which has its own set of expertise requirements, to computer-generated counterfeiting. Using today's technology, they have succeeded in issuing counterfeit banknotes which can't be detected directly by the naked eye. There was not any CNN Based algorithm for detect Sri Lankan currencies before. So, this proposed method would be helping to identify the counterfeit banknotes with higher accuracy than the existing methods. One such approach is through Convolutional Neural Network (CNN) which is being used widely due to its extraordinary performance and ability to extract applicable security features from raw images of banknotes directly without human intervention and it also helps in classifying them easily. This algorithm was trained by using 1800 images of dataset. 1200 images were genuine banknotes, and 600 images were counterfeit banknotes. The dataset was segregated into 9 classes. Such as original banknotes of LKR 20,50,100,500,1000,5000 & fake banknotes of LKR 500,1000,5000. The data set of genuine banknotes were collected by manually captured images. And data of counterfeit banknotes were provided by (CID) Criminal Investigation Department of Sri Lanka Police. The developed CNN based algorithm has made it possible to find effective and efficient solutions to problems in counterfeit banknotes detection. The overall model training accuracy was 98.19% and testing accuracy was 94.69%. Furthermore, this research will be a good approach to increase the efficiency and accuracy of payment-based machines such as ATM machines and vending machines.

Keywords: Counterfeit Banknote Detection, CNN, Deep Learning, Image Processing, Python

Image Processing Based Improved Online Attendance Marking System Using Facial Recognition

Ravishka Fernando[#1] *and Hashini Athauda*[#2]

Department of Electrical and Electronic Engineering, CINEC Campus

ravishkafernando03@gmail.com

Abstract - The image processing based online attendance marking using facial recognition research aims to reduce the time wastage of session time and identify the actual number of participants who attended the session by preventing false attendance marking. However manual attendance marking method such as the students called out by the teachers and their presence or absence is marked accordingly is complex and time wasted task in online sessions. There are low number of methods specifically designed for online attendance marking utilizing facial recognition and this research gives a more efficient and accurate real-time method for attendance marking and eliminating manual attendance marking in the online sessions. The dataset of images of students were captured through a real-time video stream from a web-camera. The research design included various image processing and machine learning techniques. The developed system was included image pre-processing steps which are resizing, cropping, and grayscale conversion. Then system operates in real time and employs the machine learning algorithms such as Haar Cascade feature and Local Binary Phase Histogram (LBPH) algorithm for face detection and recognition. The performance and results of this research were checked by using face images of several academic students. Attendance of these students were successfully marked in the system and it was achieved 97% high accuracy in real-time. Which is a significant increase in performance compared to existing literature. The research is unique in that it revolutionizes the manually attendance marking process by automating it and providing real-time attendance for online attendance management.

Keywords: Face recognition, Image processing, Machine learning, OpenCV, LBPH

Designing a Mobile Phone Accessory to Measure Upper Body Fat Percentage Using Bioelectric Impedance

KDHG Jayawardena[#], UM Senarathne, SD Karunarathne, KMGP Premadasa

General Sir John Kotelawala Defence University[1]

hashini0611@gmail.com

Abstract – Obesity has become a major threat to the society. When a person carries excess body fat that could affect their health. Knowing whether someone is obese is important as it helps to remain healthy. An effective way of measuring obesity is to measure body composition. One of the most convenient ways to measure body composition is through bioelectric impedance analysis. However, current available such machines are larger and even the portable devices are huge and not user friendly. Therefore, in the present work, a user-friendly plug and play mobile phone accessory was developed to measure upper body composition using bioelectric impedance method. The prototype was designed as a clip-on accessory with two electrodes at either side to pass a weak, less than 800µA, 50kHz alternating current across the body. The device measures the voltage difference due to body resistance and feed it into the mobile app developed for body fat percentage calculation. User requires to enter the age, weight and height to the mobile app and holds the electrodes using the index finger. Human body resistance was simulated using resistors in the range of 500 to 200000 Ohms and the voltage difference was calculated. Using the obtained voltage difference values, body fat percentage values were calculated in four age groups both in males and in females. Outputs obtained through the mobile app were in the expected range. Therefore, a working prototype of a mobile device was constructed to measure body fat percentage using bio impedance method. However, further studies need to be carried out to miniaturise and fit all components into a user attractive clip-on device similar to the designed replica.

Keywords: Bioelectric impedance, body composition, fat percentage, mobile health

Implementation of Green Concepts in Highways of Sri Lanka

D. A. Sonashi De Zoysa[#1]

Department of Civil Engineering, CINEC Campus

sonashidezoysa@gmail.com

Abstract - Both rural areas and major cities have had a rapid urbanization trend during the past century. This has made it necessary to build roads and other transportation facilities quickly. In order to meet the growing need for decent roads and amenities, researchers, engineers, and constructors had to investigate novel and affordable designed goods that would both reduce building costs and boost endurance by minimizing the environmental adverse effects. Due to the extensive industrialization that is occurring, the globe is currently dealing with serious problems associated with environmental contamination, the exhaustion of natural resources, and the energy crisis. The idea of "green concepts" aims to solve these problems by being environmentally and energy-conscious while preserving the environment for future generations. Following the international trend of employing this green concept as a means of resolving these issues, Sri Lanka's construction sector has partially embraced this idea for structures but not for roads due to several issues with its application. Thus, the purpose of this study is to investigate how green concepts can be ideally implemented to Sri Lankan expressways. This research has been focused mainly on an area of an expressway which is pavement to find out the applicability of green concepts on the two types of pavements asphalt and concrete pavements. In addition, the impression of implementation of green concepts was gathered by the construction professionals such as Construction manager Project managers, Contract Administrators, Civil engineers, Architects, Structural Engineers, and Deputy Project managers

Keywords: Green concepts, Highways of Sri Lanka

Analysis of Spatial Variation of Rainfall in Catchment Runoff

Pium Abeysinghe[#1]

Department of Civil Engineering, CINEC Campus

pium.abeysinghe@gmail.com

Abstract – It is necessary to represent the rainfall patterns in a large catchment area using a numerical model so that the catchment runoff can be simulated. It is also significant to evaluate and select an accurate method of rainfall interpolation to determine the rainfall pattern of all the sub catchments of main catchment. This study is about conducting analysis on how the spatial variation of rainfall will affect the catchment runoff. The study area selected for this research is the Kelani River catchment. The QGIS software was used to delineate the catchment. The digital elevation models for the study area will be downloaded from the United States Geological Survey (USGS) website. Rainfall data from 10 rainfall stations situated in and around the Kelani River catchment will be used for the rainfall interpolation process. The rainfall interpolation will do through the QGIS software using three selected interpolation methods namely the Inverse distance weighting (IDW) method, nearest neighbour (NN) method and the triangulation (TIN) method. The mean rainfall values obtained from each method will be used to run three simulations in a runoff model in the HEC-HMS software. Three interpolation methods did not implicit strong differences in runoff results, it can be because of other variables of the model have affected the model results for example lag time and curve number. Therefore, recommend to improve the other variables accuracy and check the sensitivity of the three interpolation methods.

Keywords: Rainfall interpolation, Catchment runoff, QGIS software, Kelani River

Comparative Study of Thermal Performance of Bamboo Fiber Incorporated Roof Slabs

Pushparaj Dilukshan#1

Department of Civil Engineering, CINEC Campus

dilukshandonz01@gmail.com

Abstract - Reinforced concrete roof slabs are a good substitution for typical Calicut tile roofs in most South Asian households as they provide better protection against natural disasters like cyclones because of their heavy self-weight. But, since the poor thermal performance of concrete, the contribution of thermal insulation materials was needed. Even though active insulation systems found, civil engineers are transforming to more greener and sustainable materials used for construction activities. Satisfying the required thermal comfort in roof slabs while controlling cost and energy effectiveness is a main advantage of natural fibres while balancing the ecology system. This paper presents a comprehensive study on improving the thermal performance of concrete roof slabs using bamboo fibre which is a good substitution for synthetic fibre materials. Revit Architecture 2022 was used to Design the slab specimen and the thermal performance of the slabs was carried out using Design Builder (V4) software. The model results were then validated with the experimental results from a selected literature source to check the design Builder software's performance. The results were in good agreement with the numerical model developed. The comparative study showed the optimum value of 0.0557 decrement in heat transfer for a 100mm bamboo fibre insulation layer in the slab thickness. It can be concluded that the use of bamboo fibre is effective for concrete slabs and the decrement factor is decreasing with the increase of thickness of more than 25mm according to the research results. Furthermore, the developed bamboo fibre insulation layer is 10% more cost-effective than synthetic fibre insulation materials when considering the material cost of synthetic fiber and other factors

Keywords: Bamboo fiber, Thermal performance

Investigation of Lathe Waste Mixed Concrete Properties

R.M.M.A.B Ranatunga[#1]

Department of Civil Engineering, CINEC Campus

<email>

Abstract - This research was done with accordance to investigate the properties of concrete when lathe waste is used as an alternative to steel fibre. The recycling of waste scrap like substances helps to maintain the ecological wellbeing of the environment. The main priority of using this as an alternative is, due to the economic crisis in Sri Lanka there is a massive lack of steel fibre due to the import issues. Therefore, lathe waste has been considered as a good alternative due to its fibrous properties. In this research M30 grade concrete has been used and the lathe waste obtained from lathe industries have been added up to 2% by different percentage amounts (0.5%, 1% & 2%). The addition of the mount of lathe waste was determined by considering the weight of the control mix before curing starts. In this investigation, the properties of lathe waste added concrete has been compared with the plain concrete (control mix) to determine the percentage variation of strength parameters. The behaviour of the compression strength of the specific concrete was tested for 7th and 28th days of testing, by uniaxial compressive strength test and the flexural or the bending strength of the concrete was also tested for 7th and 28th days of testing by uniaxial flexural strength test. Additionally, it was discovered for each combination how the workability of concrete varies when different amounts of fibres are introduced. The variation of densities was also determined for each mix. When varying amounts of fibres are added to the mixture, as compared to the control sample, the compressive strength and flexural strength showed a noticeable variation. Addition of lathe up to 1% has shown a better performance for both the strength parameters at 28 days of testing and a gradual decrease was observed after addition of 1% of lathe waste in the results. Furthermore, the workability of concrete has reduced as a result of the addition of more fibres; a super plasticizer can resolve this problem.

Keywords: Lathe waste, Compressive strength, Flexural strength, steel fibre

Implementation of Lane Following Using Image Processing on the Duckietown Platform

A Jinalka Herath1#, B Priska Perera2, C Rangana Sandekelum3 and Randeera Liyanage4

123 CINEC Campus, Faculty of Engineering and Technology, Department of Electrical and Electronics Engineering

jinalkaherath@gmail.com

Abstract - Duckietown is a popular educational platform for teaching robotics and machine learning. It is a miniature town made up of roads, intersections, and landmarks, and is populated by small, low-cost robots called Duckiebots. Duckietown is designed primarily as an educational tool for teaching student's robotics, computer vision, and AI concepts. The Duckiebot is designed with a camera and a Raspberry Pi computer, and programmed using Python to mimic the behaviour of a real autonomous vehicle and it can be programmed to obey avoid obstacles and follow a predetermined path. The traffic signs and signals are designed to be easily recognizable by the Duckiebot's computer vision algorithms. Raspi camera see the surrounding and makes decisions according to the behaviour of the live view. In order to identify the colour of the lane we have used a colour picker script that provides the command to which followed the white lines of the road. The raspi camera sends all the values and the information related to the lane curves and controls the speed of the motor according to those values. The curve value represents the degree of the deviation that is detected in the lane. To obtain a smooth curve we have used the curve list in the coding which the duckiebot to ran smoothly identifying the lane. Obstacle detection is done with the input sent through the raspi camera and it stops the vehicle and prevent them from crashing. The purpose of Duckietown is to learn about robotics and provide hand on experience on motion control and coordination. By working with the Duckietown platform, we gain practical experience with real-world robotics problems and knowledge to construct and programming of autonomous vehicles. Duckietown system provides exiting and innovative platform for teaching robotics and machine learning.

Keywords: Autonomous driving, Image processing, Lane following, obstacle avoiding, raspi camera

Designing an Educational platform with TurtleBot 3 for Enhanced Navigation and SLAM

M. D. Chathuranga Gunathilaka1# and P. Naveen Chathuranga Fernando2

Project Supervisor - Mr Randeera Liyanage

chathurangagunathilaka8@gmail.com

Abstract - In this proposal, we outline a comprehensive plan to develop an autonomous TurtleBot 3 robot, focusing on advanced Simultaneous Localization and Mapping (SLAM) technology. Our primary objectives are twofold: firstly, to create a robust SLAM algorithm utilizing sensor data for real-time mapping and accurate robot localization, and secondly, to enhance the navigation system by incorporating obstacle avoidance and ensuring smooth movement. To delve deeper into our methodology, we will employ cutting-edge SLAM algorithms that leverage sensor data to construct real-time maps, allowing the robot to navigate through its environment with precision. The integration of obstacle avoidance and terrain adaptability into the navigation system will be achieved through a combination of machine learning and sensor fusion techniques. As we embark on this project, we will conduct rigorous testing of the integrated SLAM and navigation algorithms across diverse scenarios. We aim to achieve a high rate of success in terms of mapping accuracy, localization precision, and obstacle avoidance effectiveness. Quantitative metrics will be established to measure the success rate of our experiments, providing a clear evaluation of the system's performance. Looking forward, our project envisions future works that extend beyond the initial scope. We plan to explore the integration of additional sensors for enhanced perception, investigate the scalability of our algorithms for larger environments, and consider real-world deployment scenarios. By addressing these future works, we aim to continually improve and adapt our autonomous TurtleBot 3 for a broader range of applications. In summary, this project not only focuses on the design and implementation of advanced SLAM and navigation algorithms but also emphasizes the need for continuous improvement and future exploration in the field of autonomous robotics. This educational adventure provides participants with hands-on experience, fosters collaborative teamwork, and contributes to the open-source robotics community, making it an enriching opportunity for those interested in robotics, computer science, or engineering.

Keywords: Autonomous robotics, Navigation, SLAM, TurtleBot 3, Mapping, Obstacle avoidance

Smart Home System

Kulendran Balavan[#1] *and Osith Jayathunga*[#2]

Department of Electrical and Electronic Engineering, CINEC Campus[1]

balavan1234@gmail.com

Abstract - The rapid advancement of Internet of Things technology has paved the way for the creation of smart homes that offer heightened convenience, energy efficiency, and improved quality of life. This abstract presents a comprehensive overview of the design and implementation of a smart home project aimed at integrating various IoT devices and technologies to create an intelligent living environment. The project involves the development of a centralized smart home system capable of seamlessly controlling and monitoring a diverse range of home devices, including lighting, thermostats, appliances, and garage systems. Leveraging both hardware and software components, the system enables users to remotely manage their home environment through a dedicated mobile application or voice commands via virtual assistants. The integration of sensors, actuators, and wireless communication protocols ensures real-time data exchange and responsive device interactions. The primary focus of the project lies in enhancing user experience and optimizing energy usage. Through personalized settings and learning algorithms, the smart home system adapts to user preferences and behavioral patterns, creating an environment that aligns with individual needs. Moreover, energy consumption is optimized through intelligent scheduling and automation, resulting in reduced utility bills and a lower environmental footprint. The design process encompasses device selection, connectivity protocols, data security measures, and user interface development. Challenges related to interoperability, data privacy, and system reliability are addressed through robust architecture design and thorough testing procedures. By presenting the intricacies of the smart home project, this abstract shed light on the potential of IoT technology to revolutionize modern living. The outcomes of the project highlight the seamless integration of devices, the convenience of remote control, and the benefits of energy-efficient practices. As smart homes become increasingly prevalent, this abstract contributes valuable insights into the design considerations and implementation strategies that underpin the creation of intelligent and responsive living spaces.

Keywords: IoT, Home Automation, Smart Home.

Real-Time Monitoring and Control of Environmental Conditions, Integration of Renewable Energy Sources, and Diseases Diagnosis in the Smart Greenhouse Systems

Isuru Munaweera[#1], Praveen Ekanayake[#2]

CINEC Campus, Malabe Srilanka[1], CINEC Campus, Malabe Srilanka[2]

isurunimanthamunaweera@gmail.com

Abstract - In the proposed project, based on the definition of the expected status and the current soil moisture, regulated irrigation can save water. energy conservation through carefully managed heating and cooling combined with environmental factors Internal (temperature - humidity, soil humidity) and external (temperature - humidity) environmental conditions are tracked and shown in real-time and over the course of time on a graph. Control of internal conditions (greenhouse), with user-selected values for soil moisture and temperature (heating) (automatic irrigation) measurement of the rise of production and for this, power is supplied in three main ways (solar power, battery power, and main electricity) and also to save electricity and even in the absence of electricity, everything works continuously, and processes can be monitored and controlled even then. Constructing a greenhouse that can be remotely controlled and monitored, allows people to cultivate crops while being aware of greenhouse conditions. Greenhouse farmers face common problems such as not knowing the ideal time to grow crops and not knowing accurately the optimum conditions for some crops. The objective of the proposed project is to introduce a system for greenhouse farmers that can control the parameters required for the growth of plants remotely. The proposed Smart Greenhouse system is accessible with any device with an internet connection. Furthermore, the proposed system's ability to switch between automatic and manual control adds an added advantage and the system has the ability to work without electricity as well. MATLAB and other mobile applications (Blynk IOT) are used to analyze the results gathered and to measure the growth of crop production. The system is tested to work on battery power and Main power and also it has the ability to charge the battery pack on solar power as well. The proposed project compares the outcome produced with the environmental conditions to maintain the ideal environmental condition for each crop. It provides a unique insight to improve agricultural production.

Keywords: Smart Greenhouse, IOT, Microcontroller-based System, MATLAB

QR Based Key Management System with Added Database

Ravindu Oshada Vidanapathirana [1#], Teena Fernando Palappa[2], Prasith Weerasinghe[3] and Randeera Liyanage[4]

Mechatronics Engineering, University of Wolverhampton Programme, CINEC Campus

rovidanapathirana@gmail.com

Abstract – When obtaining keys to various sections in an institution such as laboratories, a procedure is followed to ensure that records related to handing out and returning keys are available. However, in most institutions, the procedure is outdated and requires much paperwork. Moreover, an employee must be assigned to oversee whether the procedure runs smoothly. Since this process takes up time and human resources that could otherwise be used elsewhere, an automated Key Management System is proposed. In this system, each authorised user and key is assigned a unique QR code. The information encoded in the QR codes is stored in a database. The key box is equipped with a webcam, Raspberry Pi, IR sensors and a solenoid door lock module. The novelty of this attempt is that the developed system uses unique QR codes to identify both users and the keys and the developed unit has added features to generate QR codes. A physical prototype was built and tested where users can scan QR codes via the webcam, and if authorised, the door of the key box is opened allowing users to take or replace keys. While taking or replacing keys, users are also required to scan the QR codes assigned to keys. With the IR sensors, the system is fully aware of the count of keys within the box at any given time, and hence, raises error messages in any situation when instructions are not followed. Furthermore, users with administrative permissions are capable of adding or removing both keys and users from the system and are also able to view the database at any given time. Moreover, a custom Python-based user interface is utilised for seamless interaction with the system.

Keywords: key management system, QR code, Raspberry Pi, key locker, database, IR sensor, Webcam

Development of a Non-Invasive Glucose and Ketone Levels Monitoring System Using Near-Infrared and Gas Detection Technologies for Diabetic Patients

M. D. V, O. Karunaratne[#1]

[1]Colombo International Nautical and Engineering College

[#]oshadhakarunaratne@gmail.com

Abstract – Diabetes Mellitus is a common chronic, metabolic disorder. Diabetic patients need to maintain glucose at a normal level. Currently, glucose monitoring is done in an invasive method which requires blood from the patient. This method is expensive, painful and can spread infectious diseases due to contamination of the lancet. Therefore, a non-invasive method was introduced to facilitate frequent point-of-care testing without pain or discomfort. The proposed system uses Near InfraRed Spectroscopy theory, Beer-Lambert law theory and Photoplethysmography theory to measure blood glucose levels non-inversely. Diabetes Mellitus can lead to Diabetic ketoacidosis which could be life threatening. The proposed system analyzes exhaled breath using a gas sensor to determine the acetone level in the breath. Acetone levels were measured in this proposed system using gas detection technology. The results are displayed through LCD and Wi-Fi Access point displays after testing and validating. The prototype analyzer developed uses a painless method for glucose and acetone level determination. Further same prototype doesn't use consumables therefore it doesn't have a recurring cost. Glucose level measuring with Near-InfraRed spectroscopy was achievable with an error percentage of less than 10%. Future improvement of this project is to connect to a web page with a database.

Keywords: Acetone, Breath analyzer, Diabetic ketoacidosis, Diabetes Mellitus, Gas detection, Glucometer, Glucose, Light attenuation, Near Infrared Spectroscopy, Non-invasive.

Semi-Automated PCB Circuit Board Design Machine

Dinuka Samarasinghe1#, Pramod Palayangoda2, Chirath Dissanayake3, Randeera Liyanage 4

1 *Mechatronics Engineering, University of Wolverhampton Programme, CINEC Campus, Millennium Drive, IT Park Malabe, Sri Lanka.*

pramodchamika0109@gmail.com

Abstract - The research problem revolves around developing an automated Printed Circuit Board (PCB) design machine using ESP modules. Traditional PCB Circuit Board design processes can be time-consuming and require specialized skills. The aim is to create a system that leverages ESP32 modules to automate and simplify the PCB design process. The main objective of this project is minimum human interaction and the reduce the risk of injury while making the PCB circuit board. The methodology of this project is print the schematic diagram onto paper and attach the printed sheet to the copper board then put into the heating section of our machine, in this section automatically heat the copper board after few more minutes its moves to the conveyor belt. (We use the motion sensor to detect the copper board) when the motion sensor detect copper board moves the ferric chloride solution (ferric chloride filled automatically) then the motion sensor containing the ferric chloride solution is gently shaken by using gear motor. After few more minutes the schematic diagram print into the copper board and after this ink will be removed by using the tinner automatically. The automated copper board etching system's adopted approach has produced encouraging results, satisfying the initial specifications and offering effective and regulated etching procedures. This section explains any issues that were encountered and how they were fixed, as well as the final outcomes of the solution. However, the advent of the PCB manufacturing machine resulted in a substantial reduction in production time and a decrease in production costs, making it simpler for makers to create PCBs, in the future we hope to upgrade using robot arms and convert to fully automated machine.

Keywords - Heat treatment, Chemicalizing, Ink Removal Mechanism

Defect Detection in Printed Circuit Boards Using Image Processing with the Improved YOLO Convolutional Neural Network

P. R. R. R. Almeda[#1], A. A. H. V. Athauda[#2]

CINEC Campus, Malabe

rebeccarashmi200@gmail.com

Abstract - Printed Circuit Boards (PCBs) form the backbone of modern electronic devices, facilitating the various electronic component connections. Defects in PCBs can lead to malfunctions and reduced product lifespan. Achieving the balance between accuracy and speed in detecting defects of single-layer bare PCBs with limited storage and computing resources is crucial. To address this challenge, a lightweight and fast deep learning detection framework YOLOv7-MN3 is proposed. The project was conducted on various SOTA versions of the You Only Look Once (YOLO) model such as YOLOv5s, YOLOv7x, and YOLOv7-MN3. This is a neural network that works with bounding boxes as well as class probabilities. Also, this provides results promptly from a single evaluation for whole images. The MobileNetv3 framework and depth wise separable convolutions are used in the modified innovative network architecture for replacing the CSPdarknet53 backbone network. The improved YOLOv7-MN3 was trained using a custom dataset comprising 8000 images, each representing various defect types, such as missing hole, mouse bite, spur, short, open circuit, and spurious copper. These experiments were executed using the Tesla T4 GPU within the Google Colaboratory environment, equipped with CUDA version 12.0 and Python version 3.9. The results demonstrate the efficiency of proposed YOLOv7-MN3 model, achieving a remarkable detection accuracy of 91.13% and an impressive mean average precision of 98.75% for low resolution data. These results were obtained through training with a batch size of 8 over 100 epochs. Besides, the YOLOv7-MN3 model exhibits a substantial deduction in model parameters, decreasing the count from 70.84 M to 27.63 M. In conclusion, this research presents a simplified and high-throughput solution for defect detection in single-layer PCBs, highlighting the importance of YOLOv7-MN3 as an invaluable tool for real-time quality assurance in PCB manufacturing processes. Increasing the accuracy can be an expressed as a future improvement.

Keywords – Depth wise separable convolutions, Google Colaboratory, Image Processing, MobileNetv3, Printed Circuit Board, YOLOv7

Surface Anomaly Detection System Using Computer Vision Based Deep Learning Techniques: YOLO

N M H Vithanage[1#], H R Deshan[2]

[1]Department of Electrical & Electronic Engineering, Faculty of Engineering &Technology

CINEC Campus, Malabe, Sri Lanka

nmhvithanage@gmail.com

Abstract – The demand for product quality in today's industrial production lines is rising due to the growth of modern industrial automation. Conventional approaches, such as manual visual inspections and basic image processing techniques such as thresholding and edge detection, suffer from high labour intensity, low precision, poor real-time performance, and other important shortcomings due to the limitations of the human eye's vision and other technical factors. The focus of this study is to develop an autonomous system that processes real-time data and recognizes surface flaws in a range of industrial goods by applying computer vision-based deep learning techniques. This study employed a "Convolutional Neural Network (CNN)" architecture to achieve these objectives by analysing real-time visual data. In this case, we used "You Only Look Ones (YOLO)", a deep learning-based object detection framework, due to its adaptability, accuracy, and speed. Collected datasets from multiple products were trained by the Yolo segmentation model, which has more accuracy in segmenting images with pixel-level annotations. The trained model was then deployed in an autonomous system with real-time image feeding to detect flaws on product surfaces. The results showcased that the system has significant accuracy in detecting flaws on product surfaces while maintaining real-time performance. The finalized system was capable of use in various manufacturing industries by changing the trained segmenting model using a relevant dataset. By integrating this system into a production line, manufacturers could reduce production downtime and inspection costs while increasing the quality assurance of the production. In summary, this research demonstrates that this deep learning-based autonomous system has more accuracy and the advanced capability of reshaping quality inspection than conventional methods.

Keywords: Surface Anomalies, Deep Learning, Convolutional Neural Network, YOLO

PLC-Based Pneumatic Logo Puncher

Kavindya Sewmini1, Kaveesha Nanayakkara2#, Sashinka Jayalath3,
Randeera Liyanage 4

1 *Mechatronics Engineering, University of Wolverhampton Programme, CINEC Campus, Millennium Drive, IT Park Malabe, Sri Lanka.*

kaveesha.vn@gmail.com

Abstract - Industrial organizations frequently have lengthy processes with a significant margin for mistake while using the traditional manual final inspection and branding process. A novel method is put up to remedy this inefficiency, and it takes the form of a pneumatic logo puncher that is controlled by a PLC. To ensure accurate logo placement and the removal of damaged packages, this project intends to automate the sorting and logo punching procedures using PLCs, pneumatic systems, and infrared (IR) sensors. The principal aim is to develop a PLC-based system that can evaluate product quality quickly and precisely with minimal human involvement, in conjunction with a dependable and adaptable logo punching method. A printed circuit board (PCB) with an ATMEGA 32-8 integrated circuit (IC), resistors, light-emitting diodes (LEDs), relays, and 4-pin optocouplers form the basis of the system. Packages are detected by conveyor belt integration and strategically placed infrared sensors. Pneumatic cylinders are used to quickly remove black goods from the conveyor line if they are determined to be defective. Perfect white packages move down the conveyor and stop at the logo punching station, where a pneumatic system perfectly punches the logo onto the package's surface. Meticulously designed and extensively tested PLC-based Pneumatic Logo Punching Machine successfully solves the problems posed by manual procedures. Process automation can be a viable means of increasing productivity, as shown by the successful application of PLCs and pneumatics in an industrial setting.

Keywords - Logo Puncher, PCB, PLC, Pneumatic, Industrial packaging

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INDUSTRY, INNOVATION ,AND INCLUSION: THE 21ST CENTURY WAY FORWARD

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Smart Elder Care Home System

S.T.K.A.V. Silva [1], A.M.R. Eshandi [#2], and M.V.M. Jayathilaka [#3]

Faculty of Science & Engineering, University of Wolverhampton [1], Department of Information Technology, CINEC Campus [#2], Department of Information Technology, CINEC Campus [#3]

<S.A.Silva@wlv.ac.uk [1] >

Abstract – The need for prompt communication in elder care facilities during emergencies, such as sudden heart failure or respiratory issues, is critical and can be resolved by putting in place a sensor-based monitoring system. Implementing a sensor-equipped wristband and a web application that stores records and gives caregivers access to data would be a simpler strategy. The web application offers a convenient platform for accessing data in real-time or in the past, and the wristband can record significant measures. In this paper it argues that how the technology do enables early detection of heart attacks in elderly patients, warns caretakers about elevated blood pressure, and reminds them to take their medications, eat their meals, and schedule doctor appointments. Additionally, the researchers have argued how to recognize elder health problems promptly, spot heart attacks, notify carers, and control medication reminders. The research was conducted to help with elder care by solving issues with home safety by using Arduino, JavaScript, PHP, SQL, HTML, CSS, and IoT cloud integration. During implementation, requirements were gathered, user interfaces were created, and monitoring and alerting systems were put into place. This system works better than the competition and offers cutting-edge improvements for efficient elder care home. The research reveals of both hardware and software and provides medication and meal reminders. It automatically takes preventative measures when it recognizes emergencies like gas leaks and fires. The web-based program links senior citizens with their caregivers and house staff to improve communication and safety. During implementation, requirements are gathered, user interfaces are created, and monitoring and alerting systems are put into place. This system works better than the competition and offers cutting-edge improvements for efficient elder care. Overall conclusion of this research, seniors can remain peacefully at home with the right care if they receive individualized support and prompt assistance. An evaluation of a wireless sensor network-based health monitoring system's performance shows its value for caregivers and remote patient monitoring. Future research will concentrate on evaluating the system with an elderly population in a dispersed situation.

Keywords: IoT, Elder, Monitoring

LoRaWAN based extended and Secure Maritime Communication System for Fishermen

N.D.E Madusanka [1], Mr.Bhanuka Fernando[#2], and Mr.Dharshana Hettiarachchi[#3]

Faculty of Science & Engineering, University of Wolverhampton[1], Department of Information Technology, CINEC Campus[2], Department of Information Technology, CINEC Campus[3]

<M.NanayakkarawasamDangedaraEgodage@wlv.ac.uk>

Abstract- Maritime security, with a specific focus on "maritime domain awareness," forms the primary area of interest for this research. The significance of vessel identification, tracking, and supervision in bolstering marine security is emphasized, and several objectives are pursued, including the identification of suitable technologies for various vessel types and the evaluation of their contributions to enhanced marine security. Furthermore, the researchers argue for the effective management of maritime networks, emphasizing the necessity to enhance the safety of communicating fishing harvest locations, obstacle-avoidance methods and by enhancing the efficiency of low-power, affordable vessel-to-land communication methods, such as LoRaWAN. The paper aims to utilize Google Scholar for relevant publications, explore commercial products, investigate location detection techniques, examine wireless communication encryption, learn Lora module data transfer, integrate with Google Firebase, design a web-based central monitoring system, and conduct prototype testing with minimal errors. The research was conducted on developing a secure maritime communication system for fishermen, employing LoRaWAN technology and encryption technology. Boat sensors collect data, which is subsequently transferred to the land station through middle LoRa nodes that are located on buoys. Processed, and stored in the cloud using Firebase for continuous monitoring. LoRaWAN ensures data integrity through symmetric-key cryptography, with the monitoring process centrally controlled from a control station. The system's implementation facilitates efficient and secure nautical operations, benefiting fishermen and enhancing maritime security. The research also emphasizes effective data gathering, processing, and access management within the centralized web application design, advocating for the use of encryption technologies to secure data transfers. The study explores the adoption of ultrasonic sensors for boat tracking and obstacle detection, along with a GPS-based trespassing behavior detection system. Efficient communication is achieved through LoRaWAN technology, ensuring the safety of fishermen and streamlining maritime operations. Overall conclusion of this research is secure communication between land stations and boats, using encryption technology and the LoRaWAN protocol for data security within a 10 - 15 km radius. It offers a comprehensive approach to improve maritime communication by implementing domain awareness and ensuring safer and more efficient maritime operations and protecting fishermen.

Keywords: Maritime, Security, LoRaWAN

Smart shoe for tracking the progress of foot deformity treatment in child's foot

A.A.T.M Subasinghe, A.M.R.E Aththanayake[#1], and M.V.M Jayathilaka[#2]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd[1],

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, [2],

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd[3].

subasinghemadu95@gmail.com, eshandi.amr@cinec.edu[#1], mekala@sliate.ac.lk[#2]

Abstract-Abnormal feet are relatively common among new-borns. Two main types of treatment are offered to overcome this condition. Medical professionals recommended non-invasive methods like physiotherapy and surgical procedures because they are successful and appropriate for new-borns with foot deformities. The primary goal of this research is to treat these deformities in new-borns because they can affect a child's ability to walk in the long run.it is essential to correct this abnormality while the child is in still developing. In order to contribute to solution, I decided to make the decision to design a shoe with technology that enables physiotherapists to track the child's steps, an alarm to detect slips and falls, evaluate the motion of the shoe on both 2D and 3D platforms and create the database to store the details of each child's feet movement for afflicted children. The project's objective is to close the gap by creating a smart shoe and a system to track the shoe's motion throughout physiotherapy sessions.in order to create this shoe, Arduino and the 3D animation program processing will be used. As a result of this research, the treatment of the child will be greatly improved, and the physiotherapist will be able to monitor the progress of the patients more accurately than with previous methods. This research cost effective and user-friendly with Arduino. The most crucial requirement was that they needed to assess the efficacy of the treatments after taking into account the views of the parents of these type of babies. Therefore, another crucial aspect of doing this is that the parents might monitor the effectiveness of the treatments without depending on the judgments of the doctors.In conclusion, this study uses an IOT-based system and a smart shoe to treat new-borns with foot abnormalities. It increases the efficacy of the therapy and enables parents to track development on themselves.

Keywords: Children, Internet of Things, Processing IDE Software, Smart Shoe, Alarm signal

Automated Plant Disease Classifier Using Machine Learning

Jayawardana A. D

Department of Information Technology, CINEC Campus (Pvt) Ltd

dinushajayawardana98@gmail.com

Abstract – Plant diseases are the major thread in the agriculture field. Wrong identification by physical inspection (by human or farmers) on the plant diseases led to the massive loss of productivity and economical value of the yield. Early detection and treatments for identified disease crop overcomes the impact for the production. Modern day technologies have provided the solution that can predict upon multi parameters which cannot capture on human eye as the best approach for early identification and detection on diseases in crops. The aim of this thesis is to implement an automated web-based application for disease classification where to use at tomato crops. Application of Robot Process Automation using the tool UiPath, brings the automated vision for the application which is providing the functionalities of uploading and classification on the images of tomato leaves. Machine learning along with the image processing is the back-born of the application. A Convolutional Neural Network model is using for the classification which base on the training categories as healthy vs infected for selected diseases that can identify on leaves as 'Tomato Early Blight' and Tomato Late Blight'.

Keywords: ML, RPA, CNN

Internet of Things Based Emergency Communication Network with Emergency Kit

Isuru Amarasena, Darshana Herttiarachchi[#1], Bhanuka Frenando[#2]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Department of Information Technology, Engineering and Technology, CINEC Campus[2], Department of Information Technology, Engineering and Technology, CINEC Campus[3]

isuruamara123@gmail.com, bestitsha@gmail.com[#1], bhanuka@gmail.com[#2]

Abstract - Natural disasters such as floods, landslides, and cyclones are prevalent in Sri Lanka, and they frequently result in the loss of communication links, disrupting the communication and help that displaced people require. If connectivity is blocked in the first place, contacting IDPs (Internally displaced persons) and gathering data will be straightforward if a different network exists. This project aims to create a backup network which is more reliable than traditional network in an Emergency. Mesh network topology is using in this project and every home/user location anticipates being connected to this mesh network via an emergency kit. This network is easily expandable using repeaters which is also include in the project. Mesh networking is a well-known technology which has high reliability since it provides redundant links across the network. This project utilizes IoT (Internet of things) based Wi-Fi modules as main component in nodes. IoT sensors are used to collect environmental conditions at nodes. All nodes are interconnected, increasing the efficiency of the communication. Emergency kit that incorporates disaster information and interact with the user. Web based API (Application Programming Interface) is using to manage the network. The literature review of this project emphasizes the requirement of communication in an emergency, significance of mesh network as a backup network and uniqueness of this project from other related projects. Business values and feasibility of the project is discussed under the methodology. The implementation includes the testing of the artifact and functions. Tastings are demonstrated the reliability and effectiveness of the artifact successfully. Final discussion and conclusion highlighted that the feasibility of a backup network in disaster like situation and reliable communication can be successfully archive using the implemented artifact in this project and this project will help to save many human lives in a disaster like situation.

Keywords: Mesh Network, IoT Mesh, IoT emergency Kit, Emergency Mesh Network, Disaster management

Smart Street Lighting Solutions Integrating Neon and Radium Lights with AI and IoT

A.G.N.K. Sandali Wijesooriya, H.S.Sithija Menuwantha Hewage, senior lecturer Dhishan Dhammearatchi

CINEC campus (Pvt) Ltd Malabe, engineering and technology faculty, IT department.

Sandaliwijesooriya18@gmail.com

Abstract- This research report focuses on discussing the problems that foggy areas in cities like Kolkata and London encounter when intelligent street lighting solutions are put into place. The idea is to suggest using neon and radium lights along with the Internet of Things (IoT) and artificial intelligence (AI) technology to improve visibility and boost navigational safety. Weather conditions that are foggy frequently result in accidents and delays by posing severe threats to pedestrian and traffic safety. Regular street lighting systems can't always offer a solution in these circumstances. In order to overcome these barriers, this study examines the incorporation of intelligent technology. Visibility can be increased under foggy situations by integrating neon and radium lights with intelligent technology into the street lighting infrastructure. The vivid shades emitted by these neon and radium lights cut through the thick fog and improve visibility for motor vehicles and pedestrians. Additionally, the use of AI and IoT enables data collection and intelligent control of the lighting system. Artificial intelligence (AI) systems can use real-time weather information, visibility conditions, and traffic patterns to dynamically change the light's intensity and hue. This adaptive lighting system offers maximum visibility while reducing energy use by lowering or intensifying the lights when necessary. Thanks to the IoT architecture, the central control system, sensors, and lighting fixtures can all communicate without any issues. Due to the remote monitoring, problem detection, and maintenance made possible by this network's connections, operations are effective and downtime is decreased. This research report comprehensively analyzes the potential benefits and challenges associated with implementing neon and radium lights along with AI and IoT technologies in foggy areas. Additionally, it provides recommendations for policy-makers, urban planners, and stakeholders on the successful deployment and integration of these smart street lighting solutions. Ultimately, these advancements contribute to building safer and more sustainable smart cities.

Key words: IoT, intelligent street lights, neon, radium

Online voting system for clothing shop

Gimna Perera[#1]*, Buddhini Samarakkody*[#2]

Faculty of Engineering & Technology, Department of IT

gimna.perera97@gmail.com

Abstract- In a pandemic situation, or any other country situation most of customers and employees of shop are not able come to shops. Because of that there is online shopping and online working and also to reduce the paperwork to systematic method which can save time, more secure and easy. This research attempts to find a mechanism to develop a system to fine the best employee of the shop by using online voting system. This research aims are to carryout research on similar systems and the manual process of voting, To design and build a prototype for an Online Voting Systems, To Test and Evaluate the system. Final aspect of the application will be the deliver as website with Admin, Customer, Employee accounts. Customers can easily filling a registration form then create account after registration, customer can log in to their account using secret Username and Password which he/she can use to login to the system. Then customers can order cloths with different kind of designs and different types of designs. In online shopping customer occurs any types of problems. Using this system customers can do live chat with employees and take solution on time. According to the customer service customers can vote to employees. After voting to the employee, customer gets the email for security purpose. Admin can view the customers voting as report also. In this research used AI based online chatting chat bot and used Agile-based methodology. Finally can select best employee in the clothing shop monthly basis using only customers voting's without interfering of admins voting's or any other's votes.

Keywords: Online Voting, Customer, Employee.

IoT Based Smart Kitchen for Online Food Ordering System for Realtime Monitoring Experience for the Customer

A.H.H.K. Pathmasiri#1, Ms. M.V.M. Jayathilake#2, Ms. A.M.R. Eshandi#3

CINEC Campus1, Sri Lanka Institute of Advanced Technological Education 2, CINEC Campus3

harshapathmasiri@gmail.com #1, mekala@sliate.ac.lk #2, Eshandi.amr@cinec.edu #3

Abstract – **The rapid advancement of technology has revolutionized various industries, including the culinary domain. In this research, this proposed implementation of a catering website with a live cooking view, designed to enhance the culinary experience for both chefs and clients in smart kitchens. The primary objective is to provide a seamless platform that allows users to explore the healthiness of foods and witness live cooking demonstrations, and engage via communicating with professional chefs for their ordered own foods.** The proposed catering website leverages the latest IoT technologies and smart kitchen integration to create an immersive and interactive culinary platform. Through this website, professional chefs can live-stream their cooking sessions, sharing valuable culinary insights, tips, and tricks with the audience in real-time. This live cooking view using an IP Camera offers clients a unique opportunity to witness the preparation of their chosen dishes, fostering a sense of trust, transparency, and excitement throughout the catering process with the developments of Raspberry Pi board. Additionally, the website incorporates though Mic & Speaker for 2-way communication between chef and customers. As a sub function, customer can check salt concentration using ion-Selective Electrode (ISE) Sensor their food remotely as per the customer requirement if required. With intuitive user interface that enables easy navigation, menu customization, and online ordering. Clients can browse through a diverse array of dishes and place orders conveniently. The smart kitchen integration ensures seamless synchronization of real-time cooking updates, ingredient availability, and communication function, optimizing efficiency and reducing the possibility of errors. In conclusion, this artifact of the Catering Website & Smart Kitchen with a Live Cooking View will be a unique and innovative solution for the catering industry. This will provide customers convenience, transparency, quality assurance, and satisfaction. This artifact can be marketed to customers through social media platforms, online advertising, and word of mouth.

Keywords: Live Cooking View, IoT, Smart Kitchen, Raspberry Pi.

Tourist Assisting Smart Chatbot App for Public Transportation in Sri Lanka

A.P.T.M. De Vass Goonewardene[#1], Bhanuka Fernando[#2], and Dharshana Hettiarachchi[#3]

Faculty of Science & Engineering, University of Wolverhampton [1], Department of Information Technology, CINEC Campus[2], Department of Information Technology, CINEC Campus[3]

tharunvimansa@gmail.com[#1], bhanuka@gmail.com[#2], bestitsha@gmail.com[#3],

Abstract – The rapid growth of tourism in Sri Lanka has highlighted the necessity for efficient and user-friendly public transportation systems to cater to the diverse needs of travelers. In response to this demand, a web-based chatbot application has been developed to enhance the tourist experience by providing Broad assistance for navigating the country's public transportation network. This paper presents the design, development, and evaluation of a tourist-assist web-based chatbot app that offers real-time information and guidance on Sri Lanka's public transportation services. Leveraging artificial intelligence and natural language processing technologies, the chatbot engages in interactive conversations with users, enabling seamless access to travel-related information, such as bus and train schedules, ticket prices & information about other heritage places. The app's development process involved data collection from reliable transportation databases and tourist resources, ensuring the accuracy and up-to-date nature of the information presented to users. The evaluation of the tourist assists web-based chatbot was conducted through both qualitative and quantitative methodologies, examining user satisfaction, effectiveness, and usability. Results demonstrated a high level of user acceptance, with tourists commending the app's ability to simplify travel planning and alleviate language barriers when communicating with local transport services. The tourist assists web-based chatbot app has proved invaluable for tourists exploring Sri Lanka's public transportation network. By streamlining information access and empowering travelers with real-time support. As future developments in artificial intelligence and data analytics continue to evolve, further improvements and expanded app capabilities hold promise for revolutionizing travel assistance for tourists worldwide.

Keywords: Web-based Chatbot, NLP, AI

Predictive Automation of Locomotive Service Schedule for Sri Lanka Railway Department

Shashini Karunarathna [#1], Bhanuka Fernando [#2] and Dharshana Hettiarachchi [#3]

Department of Information Technology, Colombo International Nautical and Engineering Campus (CINEC), Sri Lanka

<shashinik1993@gmail.com>

Abstract - The Sri Lanka Railway Department is an important aspect of the country's transport system, featuring multiple locomotives providing public and goods transit services. However, the current manual record-keeping method for locomotive maintenance schedules presents considerable obstacles, resulting in mistakes, data duplication, and excessive maintenance costs. To address these drawbacks, the present research intends to provide an automated solution using computer networks. This project's primary objectives are to establish a complete service scheduling framework, utilizing data from stock inventory reports, maintaining a record of actions taken for replacing or updating parts, liquids, and instructions using a real-time centralized computer-based system and a mobile application to retrieve and monitoring data for train pilots. The proposed system will improve locomotive maintenance and service by increasing safety, reliability, and availability while decreasing downtime and overall maintenance costs. The research begins with an in-depth investigation of locomotive operations, which includes visits to maintenance facilities and online research. Using algorithms for data mining to identify the limitations of the current system and possible solutions, the project planned to establish a data-driven, predictive, and proactive maintenance approach. To improve decision-making and resource allocation, the system comprises data analysis, prediction using machine learning algorithms and optimization methods. Furthermore, security measures are going to safeguard user credential privacy, while user-friendly interfaces will improve usability. This project is expected to end up resulting in a transformation of the Sri Lanka Railway Department's locomotive upkeep and maintenance methods, switching from a manual record system to a more efficient, automated, and cost-effective computerized solution. The railway industry will benefit from greater performance, decreased downtime, and increased overall efficiency by streamlining maintenance operations, improving spare component management, and proactively addressing potential problems. It will also support and improve decision making due to predictive capability of the system.

Keywords: Sri Lanka Railway Department, Data Mining, Machine Learning, Computerized System, Automation, Real-time Updating

Integrating Artificial Intelligence Technologies with Spatial Computing: Identifying Methods which can Support the Integration

Thimira Dissanayaka, #*Ms.Sachini Gunasekara*

M20010315001@student.cinec.edu, #sachini.vindya@cinec.edu

Abstract - The integration of artificial intelligence (AI) technologies with spatial computing is a rapidly growing field of research. Spatial computing refers to the use of computer systems to model, analyse, and represent spatial information, such as geographic data or 3D models. AI technologies, on the other hand, are used to develop intelligent systems that can learn from data and make decisions based on that learning. The purpose of this study is to identify methods that can support the integration of AI technologies with spatial computing. The issue that has been identified in this area is the need for methods that can support the integration of AI technologies with spatial computing. This is because the two fields have conventionally been separate, with different approaches and techniques. To overcome this issue the paper will point out some methods that can support the integration of AI technologies with spatial computing. These include the use of machine learning algorithms to analyse spatial data, the development of intelligent agents that can interact with spatial information, and the use of natural language processing techniques to extract information from text-based sources. The overall conclusion of this paper will be revealed there are many capable methods for integrating AI technologies with spatial computing. These methods have the potential to greatly enhance the ability to model, analyse, and represent spatial information. At the same time, further research is needed to fully explore the potential of these methods and to develop new approaches for integrating AI technologies with spatial computing.

Keywords: artificial intelligence, spatial computing, integration, methods, machine learning

IOT-based Office Automation System for SMEs to Reduce Carbon Emissions and Potential Environmental Impacts

B. N. A. Bulathsinghala, Bhanuka Fernando[#1], Dhishan Dhammearatchi [#2]

Department of Information Technology CINEC Campus (Pvt) Ltd.[1]

naveenakalanka2@gmail.com, bhanuka@gmail.com[#1], Dhishan.Dhammearatchi@cinec.edu[#2]

Abstract - A substantial portion of the world's energy is generated from non-renewable resources, releasing carbon emissions that contribute to global warming. Minimizing carbon emissions is critical throughout the transition to sustainable energy sources. The efforts to reduce emissions are crucial until 100% reliance on non-renewable energy is minimized. This research investigates the effectiveness of an IoT-based office automation system in reducing the carbon footprint of SMEs, addressing the increasing urgency over non-renewable energy consumption in this sector. The study employed the prototype methodology, incorporating both qualitative and quantitative data gathering and analysis approaches. The research methodology combined secondary and primary research, including an in-depth literature review and statistical analysis to employ existing studies and datasets, establishing a solid basis for the study. Primary research involved the use of questionnaires to collect data from external parties, serving as additional evidence to support the study's findings and conclusions. Observation and action research were conducted at a small-scale company in Colombo, Sri Lanka. The implemented system, designed to optimize and monitor energy usage and reduce carbon emissions, utilized technology such as the NodeMCU ESP8266 WIFI ESP-12E microcontroller, PIR motion sensors, and the Arduino IoT cloud-based platform. This configuration facilitated the analysis and comparison of the system's performance before and after implementation, with each phase lasting 30 days. The findings demonstrated a significant decrease of approximately 27.85% in the total carbon footprint, highlighting the system's efficacy in mitigating environmental impacts. The research conclusion underscores the importance of urging policymakers and stakeholders to prioritize IoT-based energy efficiency solutions, offering practical insights for businesses, especially SMEs, to embrace sustainable and eco-responsible practices.

Keywords: SME, IOT, Office Automation, Carbon Emission, Global Warming

Visual Search for Home Appliance Spare Parts E-Commerce

K.A. Charaka Heshan Bandara Karawita[#1], Ms. Sachini Vindya Gunasekara[#2]

Department of IT, Faculty of Engineering and Technology, University of Wolverhampton UK, Department of IT, CINEC Campus, Malabe, Sri Lanka

C.H.KarawitaArachchige@wlv.ac.uk

Millions of home appliances are utilised in households worldwide. With the prolong use of these devices they are prone to breakdown at some point in their lifetime. Spare parts are often necessary to repair these home appliances. Lack of standardised names makes it difficult for repair technicians to source spare parts. A compressive study was conducted that confirmed this as it revealed challenges faced by repair technicians due to lack of standardised names for spare parts. This study aims to take advantage of machine learning to develop an e-commerce platform for home appliance spare parts with visual search capabilities to help repair technicians to source spare parts only using an image of the spare part. Research was conducted to find out the most accurate convolutional neural network pre-trained model for visually matching user uploaded images with the corresponding spare parts in the database. Image set of 50 was used to visual match images to their corresponding spare part images in the database, the overall accuracy results were recorded for each pre-trained model. The accuracies of the results were high, suggesting the solution to be a viable option to enhance the sourcing process of spare parts for repair technicians. This approach significantly contributes to the home appliance repair industry by offering an efficient and accurate method for repair technicians to source necessary spare parts.

Keywords: home appliance repair, spare parts, visual search

Emotion Responsive Smart Fabrics: Monitoring and Analysing Stress Levels and Depression Status in Patients.

Chanudhi Aluthge[#1], Siluni Silva[#2], and Dhishan Dhammearatchi[#3]

Department of Information Technology, Faculty of Engineering and Technology

<Sachini Vindya Gunasekara> <sachini.vindya@cinec.edu>

Abstract – The expeditious advancement of wearable has escalated the avenue for healthcare solutions. In this research, the Galvanic Skin Response (GSR) is to be exploited in the physiological identification of emotions and the Emotional Artificial Intelligence (AI) for data analysis. This conceptual study focuses to investigate and develop a system that can accurately detect and analyse the patients' emotional status in real-time. The GSR sensors amalgamated into smart fabrics amass data on the physiological responses correlated to stress and emotional arousal. These sensors compute changes in the skin's electrical conductivity, providing invaluable sagacity into a patient's emotional state. The collected data is processed using sophisticated emotional AI algorithms adept at analysing and elucidating the emotional patterns disclosed by the patients. This information is then stored in a centralized database, where healthcare professionals, specifically psychiatrists, can access and review it. By weighing up the stress levels and depression status of patients over time, psychiatrists can acquire a perspicacity of their mental well-being, identify potential triggers, and attune to personalized treatments. Furthermore, smart fabrics have an enthralling feature where the colour of fabrics changes in response to the patient's emotional status. Thus allowing the caregivers and wearer to have an instinctive understanding of the patient's emotional state, fostering empathy and timely intervention. Real-time data is collected conscientiously and stored in a centralized database, accrediting the relevant professionals to review and study patients' status. This research aims to identify and examine the potential of smart fabrics and emotional AI and GSR in mental health monitoring and research. Decomposing the database trends and patterns related to depression levels and stress, ground-breaking the reach for customized treatments and boosting mental well-being.

Keywords: Emotional AI, Galvanic Skin Response(GSR), Smart fabrics, stress level, depression status, mental health tracking.

Personal Budget Tracking with Goal Setting

Dilum Jayasinghe[#]

Department of Information Technology[1], Faculty of Engineering and Technology[2], Cinec Campus[3], Sri Lanka[4]

<dilumayeshan10@gmail.com>

Abstract – In today's fast-paced world, effective personal financial management is crucial, especially for individuals with salary-oriented incomes. Budget tracking applications have become essential tools to monitor income, expenses, and savings. However, these applications often lack personalized insights and automated goal-setting features. This research aims to develop a user-friendly Android based budget tracking application with a machine learning-based goal achievement prediction feature. The project focuses on understanding an individual's financial status, goals, and progress towards achieving those goals. Traditional budget tracking applications offer limited support for goal setting and fail to provide accurate predictions for goal achievement timelines. To address this gap, machine learning algorithms will be integrated into the application to analyse financial data and generate personalized predictions for users. The primary objective is to create an Android-based prototype that empowers salary-oriented individuals to track budgets and set financial goals. The application will provide personalized predictions for goal achievement timelines, enhancing users' financial planning and decision-making abilities. To achieve the objectives, a systematic approach will be followed, including a literature review on personal finance research, goal-setting theories, and existing budget tracking applications. Based on this knowledge, the application will be designed and developed with features such as income and expense tracking, goal setting, progress visualization, and personalized insights. The effectiveness of the developed prototype will be evaluated through user surveys and feedback analysis. By addressing the limitations of traditional budget tracking applications and incorporating machine learning-based goal achievement predictions, this research project aims to provide salary-oriented individuals with a powerful tool for managing their finances and achieving their financial goals within specific timelines.

Keywords: Budget Tracking, Android Application, Machine Learning, Goal Achievement Prediction.

Smart Parking System

Dasun Tennakoon[#1], Bhanuka Ferenando[#2], and Dharshana Hettiarachchi[#3]

Department, Faculty of Computing, University of Wolverhampton

D.C.TennakoonMudiyanselage@wlv.ac.uk

Abstract – The Smart Parking System is an innovative solution designed to address the increasing challenges associated with parking in busy cities and towns. The aim of this project is to create a smart parking system so that people can find parking spaces efficiently and effectively at their convenience. This project focuses on developing a comprehensive and automated smart parking system that empowers users to actively identify parking spaces and easily reserve parking spaces. Using cutting-edge technologies such as advanced sensors and real-time data analysis, the creation of an automated smart parking system aims to optimize parking efficiency and improve the overall parking experience. The system is designed to continuously monitor the occupancy status of each parking space across targeted parking zones using sensor networks such as LDR Sensor, IR Sensor, RFID Sensor, Stepper Motors, Relay Module, and Ultra-Sonic and transmit the collected data. An algorithm provides real-time parking availability updates to users via a mobile app. This paper also focuses on the research problem faced in designing a smart parking system and the issues highlighted here are parking reservation and payment systems, data communication and connectivity, scalability and deployment, and real-time. The article also focuses on issues such as data processing, energy efficiency, and sustainability, security, and privacy. As contained in this article, this smart parking system directly affects people's daily life and this article reflects the importance of creating this system to manage people's daily life easily. As shown here, through the creation of this system, this system contributes to reducing heavy traffic on city roads and reducing people's mental stress, the impact of vehicles on the environment, etc. Meanwhile, it offers a user-friendly, time-saving and efficient solution to parking challenges.

Keywords: Smart Parking System, Comprehensive and automated, Mobile app, Security and Privacy, Advanced sensors.

Smart and Affordable Child Protective Device for Kids in the home environment

D.G.Sunera Wimukthi[1], Bhanuka Fernando[#2], Dharshana Hettiarachchi[#3]

Faculty of Science & Engineering, University of Wolverhampton[1], Department of Information Technology, CINEC Campus[2], Department of Information Technology, CINEC Campus[3]

<sunerawimukthi@gmail.com>

Abstract-Child safety in the home environment is a critical concern for parents and caregivers. This research project aims to develop an innovative and cost-effective Smart Child Protective System for Kids, which includes a wearable device, a desktop device, and a mobile application. The goal is to effectively address common risks and safety concerns faced by children aged 5 to 12 years old at home. To identify the most prevalent issues, a comprehensive literature review, surveys, interviews with parents, and the analysis of real-life case studies will be conducted. The integration of Wi-Fi-based location detection allows for accurate indoor tracking, while the heartbeat sensor ensures real-time monitoring of the child's health and emotional well-being. To enhance data reliability, the device will be equipped to send location updates via SMS when Wi-Fi connectivity is lost, providing an additional layer of safety and assurance to parents. The desktop device will serve as a central monitoring hub, providing real-time data and notifications to caregivers. Simultaneously, the mobile application will enable parents to access the system remotely, receive instant alerts, and customize settings to suit their child's specific needs. The research will adopt both qualitative and quantitative methodologies to assess the potential effectiveness of the Smart Child Protective System. This includes comparing the accuracy, power consumption, and cost-effectiveness of Wi-Fi-based location tracking with alternative methods, such as GPS, through controlled experiments and real-world testing. Moreover, Ethical considerations and privacy protection will be paramount to ensure the safeguarding of sensitive data. Ultimately, the project aims to deliver a reliable, user-friendly, and affordable solution that enhances child safety, providing parents and caregivers with peace of mind.

Key Words: Child Safety, Smart Wearable, Home Environment, Wi-Fi-based Location Tracking

Mobile Application for Early Detection of Parkinson's Disease Using Motor & Non – Motor Symptoms

P.R.S. Perera[#1], Bhanuka Fernando [2], Darshana Hettiarachchi[3]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus, Sri Lanka[1]
Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus, Sri Lanka[2]
Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus, Sri Lanka [3]
< 88.rudmi@gmail.com >

Abstract- Parkinson's Disease (PD) impacts millions of individuals worldwide, primarily affecting mobility and daily lifestyles due to degeneration of dopamine-producing neurons in the brain. Early diagnosis is essential for effective disease management and improved outcomes. However, resource constraints in developing countries may lead to delayed detection, highlighting the necessity for innovative approaches to enhance early detection and treatment. Thus, study aims to develop a user-friendly and affordable mobile application for early PD detection, employing digital technologies and machine learning algorithms. A systematic research design was established, considering ethical principles. Comprehensive literature review was conducted, forming a theoretical foundation, recognizing early PD-symptoms and existing detection technologies. A questionnaire and a smiley selfie are employed in the mobile application to analyze PD-related indications. A Google Form questionnaire was developed to assess mobile application's feasibility and impact on PD detection. Sample sets of facial photographs of PD patients and healthy subjects were collected from Bing and real-world sources to train the AI model. The model's accuracy could be improved by using large datasets. Due to the challenge of obtaining PD facial datasets, the project relies on a small sample set of facial photographs. The design plan included providing prospective users with information of PD and nearby healthcare professionals based on mobile app's findings. High-resolution cameras, powerful processors, accurate sensors compel modern mobile phones promising medical devices for early PD detection and are hence utilized in the study. Convolutional Neural Networks were employed for AI training, offering superior accuracy in classifying PD compared to other machine learning techniques. The study revealed the feasibility and potential impact of the mobile application, identifying early symptoms and facial features in early PD detection. As PD is commonly encountered in individuals aged 60 and above, the mobile app can be used as a self-assessment tool to monitor the probability of PD development. The application's success in practice is to be validated through increased accuracy in testing with real-world data. In conclusion, study's novel approach demonstrates a cost-effective, user-friendly mobile application for early PD detection. Widespread adoption of this tool is recommended to enhance early patient diagnosis, improving quality of life. Implementing this technology holds great potential in transforming the lives of individuals and families impacted by PD, supporting timely and effective disease management.

Keywords: Parkinson's disease, Early Detection, Mobile Application, Smiley Selfie, Questionnaire.

RFID technology-based patient details, medicine details management system & automatically medicine issuing system

H.M.Lahiru Dilshan[#1], Jayathilake M.V.M[#2], Eshandi A.M.R[#1]

Department of Information Technology, Engineering, and Technology, CINEC Campus, Sri Lanka

Abstract - This research project presents the development and implementation of an RFID-based patient history and medicine management system, along with a medicine issuing system, leveraging RFID technology. The project aims to revolutionize healthcare management by providing real-time access to patient history and medication data, ensuring seamless and efficient patient care. The system utilizes RFID cards for all patients, enabling them to effortlessly access their medical information by simply touching the RFID card to the RFID reader. The doctor, acting as the admin user, can access the patient's comprehensive medical history, including past medications and medical conditions, through the integrated database. The project focuses on achieving several objectives. Firstly, it aims to enhance patient safety and treatment accuracy by facilitating the automatic dispensing of prescribed medicines based on the doctor's previous prescriptions stored in the database. Secondly, the system enables new patients to register conveniently, while doctors are pre-registered through the admin user account. The project utilizes an Arduino Uno board, RFID reader, RFID cards, LED display, and accessories to establish seamless connectivity. Additionally, three servo motors are employed to visually represent the medicine issuing process during project demonstrations. The literature review of this research highlights the significance of RFID technology in healthcare for patient identification, medication management, and real-time tracking of medical supplies. The methodology involves the use of modular designs, Data/Entity Models to architect the system effectively. The implementation of the artifact includes unit testing of individual components such as RFID readers, servo motors, and the integration of the database for data gathering. The research identifies areas for future improvement, such as scalability to accommodate larger healthcare facilities and incorporating additional security measures to protect patient data.

Keywords - RFID Technology, Database, Medicine issuing, Patient history management

AI-Driven Fake Currency Detection: A New Frontier in Currency Security

H.F.K.S.B Fonseka, Affiliation (IT Department, Faculty of Engineering and Technology, CINEC Campus) W.A.Y Sanjulee (IT Department, Faculty of Engineering and Technology, CINEC Campus). Dhishan Dhammearatchi (IT Department, Faculty of Engineering and Technology, CINEC Campus)

Dhishan.Dhammearatchi@cinec.edu

buddikakb4@gmail.com yasmiwijethunga@gmail.com

Abstract- The proliferation of counterfeit currency notes poses a significant threat to the economy, with inflationary repercussions being one of the consequential effects. Traditional methods of identifying counterfeit currency, relying solely on visual and tactile examination, have become increasingly challenging. This research proposes a technical solution using advanced techniques to improve the effectiveness of current security markings, such as holograms and fine printing. In light of the imperfect nature of existing counterfeit detection technologies and the persistent influx of counterfeit currency into the market, this study presents a novel approach utilizing Convolutional Neural Networks (CNNs) augmented with metadata spectrum analysis. This research pioneer's counterfeit currency detection by integrating metadata spectrum analysis. This process involves scrutinizing subtle variations in spectral patterns that extend beyond the conventional visual spectrum. The proposed system utilizes advanced image processing algorithms to extract and analyse these nuanced spectral features. Distinct markers with unique spectral signatures are strategically embedded onto banknotes, enhancing security. These markers are designed with unique spectral signatures that are imperceptible in regular viewing conditions. The AI-driven detection system distinguishes genuine from counterfeit currency by analysing these markers, ensuring covert and robust authentication, resilient to replication attempts. The embedding process involves precision printing techniques, where specialized inks or materials with specific spectral properties are applied to designated areas on the banknotes. These markers remain latent under normal lighting conditions but become discernible under the scrutiny of the proposed detection system. The proposed method uses an AI-powered detector to authenticate currency, ensuring its authenticity and enabling swift detection of counterfeit notes, making it valuable for organizations handling high-volume transactions. Furthermore, widespread adoption of this system across multiple organizations within a country would foster a robust network for identifying counterfeit currency notes in circulation. In summary, this research paper aims to combat economic consequences of counterfeit currency production and dissemination by developing an AI Detector machine using AI and CNN technology to swiftly identify and remove counterfeit banknotes from circulation.

Key Words: - Counterfeit Money, CNN, AI Technology, Metadata Spectrum Analysis,

Fingerprint-based Smart Election System

W.K.Miran Virajitha [#1], M.V.M. Jayathilake [#2]

Cinec Campus

< T.S.BellanaArachchige@wlv.ac.uk >

Abstract- The goal of this research project is to create a unique web application using Spring Boot, Spring JPA, Thyme leaf, and MySQL. The research problem is concerned with reducing inefficiencies in web application development, optimizing data management, and improving user experience. The key goals are to develop a high-performance online application with dynamic user interfaces and seamless data flow, as well as to provide safe data storage. The study process takes a comprehensive approach that incorporates essential technologies. Spring Boot is the application's backbone, streamlining development duties with its convention-over-configuration approach. Spring JPA makes effective object-relational mapping possible, allowing for seamless database interfaces for faster data management and retrieval. Thyme leaf, the front-end framework, improves user interface development by allowing users to see real-time data. Because of its robustness and scalability, MySQL was chosen as the database management system, providing data integrity and security. The web application is created with an emphasis on performance optimization and responsiveness through rigorous experimental design and iterative development. The system's components are rigorously tested for functionality and dependability, and user feedback is constantly gathered to improve the user experience. The results reveal that the web application was successfully implemented, with improved performance, improved user interfaces, and efficient data flow. Spring Boot and Spring JPA integration greatly minimizes boilerplate code, resulting in increased development productivity. Thyme leaf enables developers to create dynamic and flexible front-end designs that increase user engagement. MySQL's ACID compliance enables dependable data storage and retrieval, protecting essential information integrity. The debate digs into the benefits of integrated technologies, focusing on their overall impact on development productivity and user pleasure. The research project meets its goals by optimizing the program's back-end and front-end operations, resulting in a feature-rich, resilient, and user-friendly online application. Finally, the successful integration of Spring Boot, Spring JPA, Thyme leaf, and MySQL in this research project offers a convincing solution to the issues of online application development. The finished online application outperforms the competition in terms of performance, responsiveness, and data security, matching the requirements of current web development. The study provides vital insights into harnessing these technologies for efficient and successful web application design, laying the groundwork for future improvements in the industry.

Keywords: Spring boot, ThymeLeafe, MySQL.

The Attendance Tracking and Analysis System with Emotion Detection

Suresh Madusanka [#1], Bhanuka Fernando [#2], and Dharshana Hettiarachchi [#3]
Faculty of Science & Engineering, University of Wolverhampton [1], Department of Information Technology, CINEC Campus[2], Department of Information Technology, CINEC Campus[3]
suresh.mdsnka@gmail.com[#1],bhanuka@gmail.com[#2], bestitsha@gmail.com[#3],

Abstract - The Attendance Tracking and Analysis System with Emotion Detection is an innovative project that aims to transform attendance monitoring and student participation assessment in educational institutions. This system, which uses face recognition and machine learning techniques, provides an innovative framework for automating attendance tracking, analysing students' conduct in class, and generating relevant reports for parents and Teachers. Traditional manual attendance processes can frequently be wasteful and vulnerable to mistakes, wasting significant time in the process. My proposed method, on the other hand, avoids this human effort by using superior facial recognition technology to automatically mark students' attendance. The technology can reliably recognize students and compute the average time they remain actively engaged in the classroom through using best effective machine learning techniques that match with this System. Besides from attendance tracking, the system's ground-breaking feature is its ability to analyse students' emotions and behaviours during class hours. It is possible to identify indicators of dullness and tiredness in students using facial expression recognition and Principal Component Analysis (PCA), allowing teachers to modify the way they teach for increased engagement and learning outcomes. The Attendance Tracking and Analysis System with Emotion Detection is a big step toward a more efficient and successful educational process. It has the ability to increase student engagement and academic success by empowering teachers to alter their teaching tactics and increasing parental involvement. The project establishes the foundation for future study and development in the use of modern technology to improve education.

Keywords: Attendance Tracking, Machine Learning, Facial Expression Recognition, Emotion Detection

Brain Uploading: Unveiling the Theoretical Prospects of Transferring the Human Brain Functions to a Computer.

Dushyanthi.B (IT Department, Faculty of Engineering and Technology, CINEC),
G.A.P.S.Susilarathne, M.A.K.A.Masinghe
dushyanthibaskaran@gmail.com
prabha200092@gmail.com
anuradhamasinghe06@gmail.com
< Mr.Dhishan Dhammearatchi, Dhishan.Dhammearatchi@cinec.edu >

Abstract-The idea of copying the brain onto a computer to provide a form of life after death is a concept rooted in the field of Tran's humanism and theoretical speculation on the nature of consciousness and identity. The proposition suggests that by mapping and replicating the intricate structure and functioning of a person's brain, including their memories, thoughts, and personality, it might be possible to transfer their consciousness into a digital medium. Sometimes to solve a global problem research team needs master minds and ideas of some important people. If those minds are not alive, problems cannot be solved easily. At that time, similar ideas are needed for the research team. After death, researchers cannot receive their thoughts. In the end, we can understand, it's theoretically possible to copy the brain onto a computer and so provide a form of life after death. Therefore, researchers try to store human memory and give rebirth to their memories. By copying the brain onto a computer, it is believed that this information could be preserved and potentially shared with others, contributing to the collective knowledge of humanity. It may enable the transfer of expertise, insights, and wisdom from one generation to another. So, man can live forever. This means that humans are represented by memories. Life after death raises philosophical and ethical questions about personal identity, mind-body relationships, and immortality. Philosophers, theologians, and scientists have debated these topics for centuries. While advances in neuroscience and computing continue to expand our understanding of the brain, it is essential to approach the idea of copying the brain onto a computer and achieving life after death with skepticism and critical analysis. It remains an intriguing topic for speculation and philosophical exploration, but its practical realization, if ever possible, is likely far beyond our current scientific capabilities.

Keywords: Copying the brain, Life after death, Transfer of consciousness, immortality

Smart Intensity Control system for a Lamp

E.K.D. Lakmal[#1], A.M.R.E. Aththanayake [#2], and M.V.M. Jayathilake [#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Department of Information Technology, Engineering and Technology, CINEC Campus [2], Sri Lanka Institute of Advance Technological Education [3]

dushanthalakmal8@gmail.com [1] , eshandi.amr@cinec.edu [2] , mekala@sliate.ac.lk [3]

Abstract-The "Smart Intensity Control System for a Lamp" project introduces an innovative solution that revolutionizes the conventional lamp usage by incorporating Internet of Things (IoT) technology and a user-friendly mobile application. The main objective is to address the limitations of existing products by enabling users to adjust lamp intensity through different modes, all controlled via the developed mobile application. The project focuses on developing an IoT intensity control circuit using Arduino and necessary modules, creating a master-slave architecture for a comprehensive smart lighting system. Unlike conventional Bluetooth-based setups limited to single bulb control, this project employs Wi-Fi technology, allowing remote control regardless of the user's location. The mobile application, integrated with a database, empowers users to control the master microcontroller remotely, manage multiple nodes, and switch between different intensity modes. Furthermore, it provides consumption reports for analysing and comparing intensity usage during specific timeframes, promoting energy-conscious decisions. A key feature of the project is the seamless integration of additional devices into the system through QR codes, eliminating the need for complex configurations. Voice command control enhances the user experience, enabling hands-free lamp operation through the application. In conclusion, the "Smart Intensity Control System for a Lamp" offers a versatile, efficient, and scalable solution that elevates traditional lamps into smart, interconnected devices. By incorporating IoT technology, Wi-Fi connectivity, and a user-friendly mobile application, the project enhances user convenience, promotes energy efficiency, and sets new standards for intensity control and remote management in modern lighting systems.

***Keywords*-** Master-Slave Architecture, IoT, Arduino

Enhancing Network Management Efficiency through Virtual Intelligent Network Assistant and IoT Integration

E N R Hathwaick[#1], Ms. M.V.M. Jayathilake [#2], and A.M.R.Eshandi[#3]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus1, Sri Lanka Institute of Advance Technological Education2, Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus [3]

eshanhathwaick2@gmail.com [#1], mekala@sliate.ac.lk [#2], eshandi.amr@cinec.edu [#3]

Abstract- A virtual assistant that can interact with clients is provided by the Virtual Intelligent Network Assistant, an AI-driven tool that aims to improve customer service and support. The integration of Internet of Things (IoT) devices into Local Area Network (LAN) networks has the potential to accelerate the resolution of network issues by streamlining the process of determining device accessibility and reducing the need for manual inspections. The suggested method involves applying algorithms to automatically analyse data gathered from Internet of Things (IoT) devices. This makes it possible for a smart assistant to decide when a gadget is available and to foresee future problems. In order to properly deploy the automated system, the project identified a number of constraints and challenges, and also offered several potential solutions. By effectively resolving the difficulties that were raised, this project demonstrated the potential for automating network maintenance through the combination of IoT and AI technology. A more reliable and available network as a result of automated device configuration, monitoring, and problem prediction were among the promising results of the suggested system. Network administrators were able to significantly reduce the number of on-site employees they required thanks to the remote administration features of the mobile app, which saved money and time. The project's conclusions and the knowledge obtained from its execution serve as a solid foundation for upcoming technological advancements in network automation and management.This project has a number of benefits, some of which include enhanced operational performance, increased network accessibility, and reduced support costs. In addition to this, our group has developed a mobile application that provides network managers with the ability to perform fundamental network management activities remotely. This innovation increases the amount of work that can be accomplished with a given amount of people by a significant amount.

Keywords: Virtual Intelligent Network Assistant, Internet of Things (IoT) ,Network Automation ,Remote Network Management AI-driven Tool ,Network Optimization

Introducing a digital event calendar system for government schools in Sri Lanka

G.D Dewmini Chathurya Weerasinghe[#1], L.P Nipuni Rangika[#2], S.P. Roshini Anupama Priyadarshani[#3],
Dhishan Dhammearatchi[#]
Faculty of Engineering and Technology, CINEC Campus- Malabe

chathuryadg22@gmail.com, nipunirangika2@gmail.com,anupamaroshini039@gmail.com,
Dhishan.Dhammearatchi@cinec.edu

Abstract- Digitalization is a part of modern technology. It is currently spreading at a rapid pace Companies that embrace digitalization can take advantage of new technologies such as artificial intelligence, the Internet of things, and cloud computing to automate processes, increase efficiency, and create new opportunities. According to digitalization, introducing the digital event calendar system for the system of schools in Sri Lanka will be a turning point for the general school system. In general, the Sri Lankan school system is conducted under the manual system which has many failures in time management and giving awareness to the relevant parties. The main purpose of that project is to convert the manual event-managing system to a digital event-managing system. Referring to published research articles and opening a survey of Google Forms for students, teachers, parents, and administrators were the methods that we followed. The features of the project are a digital display that displayed the current event and upcoming events regard to the students and the teachers at the school, and it sends notifications to the given telephone numbers of parents of the students with full descriptions of upcoming events. Including what the event is, what the contribution of parents that the school needs, Date, time, and venue it wishes to be held. The results enhance a digital event calendar in Sri Lanka and can be useful for the school system, with details, event highlights, and timer features. This paper will focus on what is the digital event calendar, what its role is, the key benefits to the parties of a school, and how can develop it properly and for further workouts. Future research could explore additional features to improve the functionality of digital event calendars.

Keywords- Digital, System, Event Calendar, Digitalization.

The Remote Computerized Inventory Management System for medium or small-scale supermarkets.

G.H. Chamod Ayeshcariya Hewage[#1] , Mrs. Sachini Vindya[#2], Mrs. Buddhini Samarakoddy[#3]

Cinec Campus Faculty of Engineering and technology [#1], Cinec Campus Faculty of Engineering and technology[#2] , Cinec Campus Faculty of Engineering and Technology[#3]

hewageca26@gmail.com[#1], Sachini.Vindya@cinec.edu[#2], buddhinisam@hotmail.com[#3]

Abstract- During the pandemic, many businesses in Sri Lanka quickly embraced remote working practices. Organizations across diverse sectors shifted most operations online, requiring staff to work from home. However, implementing a computerized systems for medium or small-scale firms poses challenges. This project focuses on addressing inventory management issues at "Sea-Fair Food City" a medium-scale supermarket in Galle Sri Lanka. Currently using the manual method, the supermarket faces problems such as business interruptions, time efficiency and security threats amid ongoing pandemic. Therefore, considering these issues, the remote computerized Inventory Management System (IMS) is designed to promote remote working and enhance the inventory management within Sea-Fair Food City supermarket. The IMS caters to two user roles administrators, and sellers. Administrators can manage inventory, generate sales reports and more. Sellers have the functions for selling goods online. An online retail site was also created to facilitate customer online purchases. Moreover, the project employs Agile methodology for its flexibility in project management, emphasis on collaboration and continuous client feedback and promotion of incremental and iterative development by breaking the project into smaller, manageable tasks. In addition, the primary data gathering methods involved in supporting statements in the research paper included the use of questionnaires (60 responses gathered) and relevant research papers. Furthermore, the project reveals technology utilization gaps between large and small-scale supermarkets during crises, explores challenges for medium-scale supermarkets in technology implementation, shows inventory management's importance and reveals benefits of Agile methodology benefits.

Keywords: Remote working, Inventory management, manual method, Agile methodology.

SMART Laboratory Information Management System (LIMS)

G.K.M Peiris[#1], Ms. Anuththara[#2]

Faculty of Engineering & Technology, Department of IT

Anuththara.Nayanamini@cinec.edu

Abstract -The apparel industry relies heavily on third-party laboratories to conduct sample testing, but the process of logging samples and assigning tests has often been time-consuming and inefficient. This research project aims to address these challenges by implementing an AI-driven upgrade to the SMART Laboratory Information Management System (LIMS), with a focus on automating the test assigning process. The main research problem is the need to reduce time wastage and improve customer satisfaction by expediting test report delivery. Additionally, the objective is to enhance the productivity of the login officer and the overall testing process through the integration of an AI-driven Web Application. The research methodology involves designing and developing an AI algorithm integrated into the existing SMART LIMS. The AI algorithm utilizes customer-provided Test Request Forms (TRFs) and considers factors such as fibre content and buyer standards to automatically suggest appropriate test assignments. The login officer can then review and finalize the suggestions, streamlining the sample handover process to laboratories. Results and discussions focus on the effectiveness of the AI-driven test assigning process. Time efficiency metrics, customer feedback, and productivity improvements of the login officer are analysed to assess the impact of the upgrade. The research concludes that the AI upgrade successfully streamlines the sample login process, significantly reducing time wastage, and increasing efficiency. By automating the test assigning process, the system optimizes productivity and ensures that test reports are delivered within the requested timeframes. This enhancement strengthens customer satisfaction and upholds industry standards. The implications of this research are substantial, offering apparel industry laboratories a cutting-edge solution to expedite sample testing and improve overall operational performance. Embracing AI technology enables the industry to enhance its competitiveness, meet customer expectations more effectively, and maintain its commitment to providing high-quality services.

Keywords: Apparel Industry, Third-party Laboratories, LIMS, AI-driven Upgrade, TRF, Test Assigning, Sample Testing

Arduino based election automation system using fingerprint, two factor authentication.

G.G.K.G.B.Gamage, Bhanuka Fernando [#1], and Dharshana Hettiarachchi[#2]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus1, Sri Lanka Institute of Advance Technological Education2, Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus [3]

kosalageethma95@gmail.com , bhanuka@gmail.com[#1], bestitsha@gmail.com[#2]

Abstract – This research project focuses on the development of a comprehensive fingerprint-based election automation system, integrating a two-way authentication process with SMS verification before enabling voters to cast their ballots. The study aims to revolutionize the voting process by enhancing security, accuracy, and inclusivity. The main objective of this project is to design and implement a robust biometric-based voting system utilizing fingerprint recognition technology to authenticate voters; and secondly, to introduce an additional layer of security through two-way authentication. The initial phase involves a comprehensive literature review to gain insights into election technology. Then the system's design is developed. In the experimental design phase, a prototype of the fingerprint-based election automation system is created. The system's performance in accurately verifying voter identities and preventing duplicate voting is assessed. Additionally, user feedback is collected to evaluate the system's usability and identify areas for improvement. Future development of this system could encompass the integration of other biometric modalities, such as facial recognition or iris scanning, to enhance security and accuracy further. Additionally, exploring the incorporation of blockchain technology can establish an immutable and transparent voting record, bolstering the system's integrity. To ensure inclusivity, special consideration should be given to making the system accessible to individuals with disabilities, potentially incorporating voice-guided interfaces or braille displays to accommodate their needs. The fingerprint-based election automation system, equipped with two-way authentication through SMS verification, demonstrates significant success in achieving its objectives. The biometric authentication process proves highly effective in accurately identifying eligible voters, substantially reducing the risk of voter fraud and manipulation. Through continuous development and refinement, the fingerprint-based election automation system with two-way authentication can pave the way for more efficient, accessible, and trustworthy elections, fostering an inclusive and participatory democratic society.

Keywords: SMS, two-way authentication, biometric authentication

Electronic Voting System using Biometric Authentication Technology for Inclusive and Efficient Elections.

G.H.N.L. Thilakarathna [#2] and *Mr. D. Dhammearatchi*[#1]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[2],

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka [1]

nimeshthilakarathna1997@gmail.com, Dhishan.Dhammearatchi@cinec.edu

Abstract - In democratic societies, elections are vital for citizen participation in governance through representative selection. However, traditional paper-based voting systems encounter challenges concerning efficiency, accessibility, and accuracy. To address these issues and promote inclusivity while reducing election costs, the "Electronic Voting System using Biometric Authentication Technology for Inclusive and Efficient Elections" is proposed. The project aims to enhance accessibility for all voters, including those with disabilities, while streamlining the electoral process. This voting system will enable normal users to verify their identities using fingerprint authentication and cast their votes via a touchscreen interface. For individuals with disabilities, facial recognition technology will provide secure authentication, while voice commands will facilitate convenient voting. The voting system uses fingerprint authentication and facial recognition, mitigating the risks of impersonation and fraudulent voting. The cloud-based data processing will enable real-time vote tallying and enhance efficiency, making the electoral process more transparent and accurate. Furthermore, adopting this electronic voting system is expected to yield significant cost reductions compared to traditional paper-based methods. Eliminating physical ballots and automating vote counting will optimize resource allocation and minimize printing expenses.

Keywords – Electronic Voting System, Biometric Authentication, Accessibility, Cloud-based Data Processing, Cost Reduction

Streamlining Emergency Ambulance Services with Fast API: A Location-Based Approach for Efficient Healthcare Delivery

G. N Induruwage[1], D. U Vidanagama [2]

1Department of Information Technology, General Sir John Kotelawala Defence University, Sri Lanka.

2Department of Information Technology, General Sir John Kotelawala Defence University, Sri Lanka.

Abstract- In the face of escalating challenges in emergency healthcare services, achieving resilience has emerged as a critical objective. This research paper examines the potential of a location-based emergency ambulance booking system to bolster resilience in the 1990 Suwa Seriya. By embracing digitalization, sustainability, and sectoral transformation, this study addresses the urgent needs of the healthcare system. Through a comprehensive mixed-methods approach, including semi-structured interviews and a web-based survey, valuable insights are gathered from patients, hospitals, and healthcare service providers. These insights inform the development of "Ambu Finder," an innovative solution utilizing advanced technologies. The system, built with the Python framework Fast API, incorporates a Rest API for location tracking, allowing users to swiftly request an ambulance during emergencies. Leveraging geolocation technology, Ambu Finder identifies nearby hospitals with available ambulance services, enabling prompt responses and reduced emergency response times. Additionally, the application, developed using React Native for the mobile platform, offers registered users the convenience of uploading their medical reports, and ensuring hospitals are well-prepared to handle critical situations. This research sheds light on the transformative role of digitalization, sustainability, and sectoral transformation in enhancing resilience within emergency healthcare services. By emphasizing the integration of these three pillars and leveraging cutting-edge technologies such as cloud storage, the study underscores their pivotal significance in the successful implementation of the location-based emergency ambulance booking system. The findings provide crucial insights for healthcare stakeholders and offer recommendations for further research and practical implications, ultimately paving the way towards a more resilient healthcare system.

Keywords: Location-based emergency ambulance booking system, Digitalization, Resilience

Monitoring Wi-Fi radiation to chili plant and supporting system monitoring Wi-Fi radiation

Damith Lasantha[#1], Dharani Abeysinghe[#2], and Eshandhi[#3]

Department of Information Technology

damith777lasantha@icloud.com

Abstract- Wireless devices are most popular and gradually develop in their stages which are indoor and outdoor. This study was conducted to determine the radiation emitted by home use Wi-Fi router affect chili plants. Agile methodology was used to research and develop the system .Main objective was gain knowledge about radiofrequency radiation and its impact on plants. The one set of chili seeds was placed in a small greenhouse chamber kept in a normal environment and was exposed to radiation generated by 2 WI-FI routers. Other set of chili seeds was placed in a small greenhouse chamber with identical conditions with no Wi-Fi routers. After one and half months these two chili plant samples were placed in planting bags and remove from the greenhouse chamber and kept them to normal environment with identical conditions. Still, one sample was exposed to radiation generated by 2 Wi-Fi routers. The result was chili plants with Wi-Fi radiation exposure have low height when compared with no Wi-Fi radiation sample. The average height growing variation 4.13 for Wi-Fi expose sample and 4.69 for other sample. The average leaves size variation is 0.30 and 0.27 for the Wi-Fi radiation exposure and no Wi-Fi exposure sample. Several plants with Wi-Fi radiation exposure samples have a change of leaves with compare with the no WI- FI radiation samples. Wi-Fi expose sample has low yield (150g) and other sample has high yield (275g). As a supporting device for this research made a Wi-Fi signal radiation monitoring device .Using this device measured the Wi-Fi radiation level of two routers used in this project. In conclusion radiation of Wi-Fi routers reduces plants' growth, contributes to chlorosis, and alters the size of leaves.

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Empirical investigation of Increasing public Wi-Fi security by using RADIUS server, three factor Authentication and VPN

H.M.R.Wijayapala[#1], M.V.M. Jayathilaka[#2], and A.M.R.Eshandi[#3]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus[1], Sri lanka Institute of Advance Technological Education[2], Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus[3]

manusha.randula22@gmail.com [1] , mekala@sliate.ac.lk [2] , eshandi.amr@cinec.edu 3

Abstract - The rapid expansion of public Wi-Fi networks has changed the way users access the Internet, providing unmatched convenience connectivity. Because of the convenience of public Wi-Fi, there are also inherent security risks as these networks are vulnerable to cyber threats and unauthorized access. Data breaches, identity theft and unauthorized access to sensitive information are the top concerns, with 80% of the general public are expressing concerns about the security of public Wi-Fi networks. This research paper presents a comprehensive security framework and developed a prototype for improving public Wi-Fi security by leveraging the Remote Authentication Dial-Up User Service (RADIUS) server and implementing three factor authentication (username/password, one-time password (OTP), and face recognition) in the login application. The framework ensures a secure internet connection developed with a VPN connection through AWS OpenVPN server. The prototype demonstrates the effectiveness of the proposed security measures. The importance of this project is to reduce the risks associated with the use of public WiFi. With the majority of the public expressing security concerns, the need to improve security is clear. The RADIUS server serves as a centralized authentication and authorization platform that carefully validates user credentials and manages network access. Integrating three-factor authentication simplifies the login process by encouraging multiple authentications to reduce the risk of unauthorized access and identity theft. This multi-factor approach instills confidence in users by providing a secure foundation for their online activities on public Wi-Fi networks. The framework uses VPN connections to create encrypted tunnels between user devices and the Internet and to protect user data transmission from potential eavesdroppers and malicious entities on a public Wi-Fi network. This strong encryption ensures user privacy, protects sensitive information, and promotes a secure and private online experience. Prototype development has successfully demonstrated the effectiveness of the proposed security solution to improve public WiFi security. Research shows that the developed prototype effectively improves the security of public WiFi networks. By addressing the risks associated with public Wi-Fi networks, such as privacy breaches and identity theft, this research helps foster a secure digital ecosystem that ultimately benefits users and encourages broader adoption of public Wi-Fi networks. Findings underscore the importance of implementing advanced security solutions to protect user data and privacy, creating an ever safer online environment for everyone.

Keywords- *VPN, Three Factor Authentication, RADIUS*

The smart Waste Management System

Hettiwaththage Pasindu Sathpura

Department of information technology

<sathpurapasindu@gmail.com>

Abstract- The Smart Waste Management System "SWMS" is an innovative and efficient solution aimed at revolutionizing waste management in urban environments. With rapid urbanization and population growth, traditional waste management approaches have become inefficient and unsustainable. The system includes smart bins with IoT sensors that monitor waste volumes in real-time. These sensors transmit data to a central control center, allowing waste management agencies to accurately plan and route garbage collection vehicles, reducing unnecessary trips and minimizing fuel consumption. In addition, SWMS uses advanced data analytics to predict waste generation patterns, allowing you to plan ahead for peak collection times and special events. In addition, SWMS promotes recycling and waste reduction through public participation. It includes an easy-to-use web application that enables residents to access real-time waste data, receive waste management notifications, and access recycling resources. By providing knowledge to the public, SWMS promotes responsible waste management practices and promotes a culture of sustainability. The benefits of implementing a smart waste management system are far-reaching. It reduces operating costs for waste management agencies, minimizes carbon emissions and extends landfill life. Additionally, the system promotes a cleaner and healthier urban environment, improving the quality of life for residents.

Keywords: Innovation, Efficient solution, Revolutionize, Data analytics, Optimize

AddressMe – Address Finder and Tracking Application with Google Satellite System

I.Sathma Samarakoon[#1]

Department of IT, Faculty of Engineering and Technology, University of Wolverhampton.UK,

Department of IT, CINEC Campus.Malabe

inurisamarakoon@gmail.com

Abstract- The AddressMe application is designed to solve the problem of finding exact locations and directions to a house, even when the home address is provided. Many people struggle with this issue when visiting a new place. This application aims to make it easier for people to find a home address with accurate directions. By using the AddressMe application, individuals can save time and effort that would otherwise be spent searching for an unknown home address. The application provides the exact location of the house and offers the option for visitors to notify the house owner of their arrival. The main features of the AddressMe application include location and direction finding of a home address, the ability to save locations for future use (even when the house owner is not at the current location), the generation of a random address number that can be used instead of the traditional long home address, and a visitor message notification system. The development of the AddressMe application followed the agile methodology. The Android Studio platform was used for development, with Java as the programming language and Firebase as the database system. While the application is primarily focused on the general public, it also holds significant value for delivery people who rely on finding accurate home addresses. By simplifying the process of locating and navigating to a specific place, the application offers a new and improved user experience compared to traditional navigation applications. In conclusion, the AddressMe application is a user-friendly solution for finding home addresses and directions. It saves time and effort, provides accurate location information, offers offline address saving, generates alternative address numbers, and includes a visitor message notification system. Whether for personal or professional use, AddressMe is a valuable tool for anyone in need of reliable location and direction finding.

Keywords: GPS, Geolocation, Google API, Google Satellite

Map System and Early Warning System for Destination Planning after Flight.

Imna Isthikar, Imna Isthikar, Dhishan Dhammearatchi

Department of Information Technology

CINEC Campus, Millennium Drive, IT Park, Malabe, Sri Lanka

imnaisthikar117@gmail.com,Dhishan.dhammearatchi@cinec.edu>

Abstract- The fast growth in artificial intelligence (AI) technology has transformed several sectors, including travel and tourism. This research offers a unique Map System and Early Warning System driven by (AI) for post-flight destination planning. The Map System uses (AI) algorithms and data from multiple sources to deliver personalized and complete information about destinations. The system provides dynamic maps that demonstrate areas of interest, local attractions, recommended routes, and real-time information such as weather updates, traffic conditions, and popular events by evaluating historical data, user preferences, and current trends. Travelers may then make educated selections and enhance their travel experiences depending on their interests and limits. The Early Warning System employs artificial intelligence algorithms to identify probable obstacles or interruptions that visitors may face at their selected locations. The technology may identify rising threats like political instability, natural disasters, and health risks by evaluating massive volumes of data from sources such as social media, news feeds, and public databases. These alerts are provided in real-time to travelers, allowing them to change their plans and guarantee their safety and well-being. The use of artificial intelligence in the Map System and Early Warning System has significant advantages over traditional destination planning approaches. The customized and dynamic nature of the maps improves the user experience by giving customized recommendations and decreasing information overload. Furthermore, the Early Warning System tackles safety problems proactively, allowing passengers to reduce risks and make educated decisions. This study includes (AI) technology, data analytics, and field expertise to create an integrated system for post-flight travel planning. The Map System and Early Warning System help to make traveling more efficient, personalized, and secure. To improve the whole travel planning process, future updates may incorporate features such as integration with transportation providers, hotel suggestions, and local language assistance.

Keywords: Security, Intelligent, Proactive Planning, Risk Mitigation, Destination Planning.

Track My Bus: A Mobile application for Passengers.

J K Avishka Vinod Jayawardana#1

Department of IT, University of Wolverhampton

Department of IT, Cinec Campus, Malabe

avishkavinod1@gmail.com

Abstract- A cutting edge Android app called "Track My Bus" was created to give users comprehensive information about buses and drivers moving between Colombo and Panadura. The project intends to revolutionize public transportation by providing consumers with real-time information and overcoming the shortcomings of conventional tracking systems by deploying a special GPS tracking system. In order to increase passenger convenience and efficiency while also improving operational management for transportation authorities, this project award is concentrated on software development, data gathering, and test cases. The bus tracking system underwent extensive testing, and the results were highly encouraging. Passengers accessing real-time bus stops and estimated arrival times experienced significantly shorter wait times, resulting in increased overall satisfaction. The technology also improved bus operators' punctuality and resource allocation, leading to optimized routes and enhanced operational efficiency. Furthermore, it enabled the identification of areas with heavy traffic and bottlenecks. The effective implementation of the system and positive feedback from both commuters and transportation officials highlight its potential to revolutionize urban mobility. By providing real-time information to users and operators, the app addresses significant challenges in public transportation, leading to an improved commuting experience in cities. The "Track My Bus" project has changed the way people travel for the better. With its real-time bus tracking system, waiting times are greatly decreased, timeliness is improved, and passenger satisfaction is raised. The useful information discovered through data analysis has the ability to influence municipal design and traffic management for the better. This cutting-edge technology epitomizes the future of public transportation by providing regular updates to both passengers and drivers, providing a more convenient and effective travel experience for all parties involved.

Keywords: bus tracking system, real-time tracking, mobile application, vehicle tracking

Analysis of the threats posed by artificial intelligence in education

Shanmugam Janani[1], J.I.S. Jayaweera[#]

[1]Department of Information Technology, Faculty of Engineering & Technology, CINEC Campus, Malabe, Sri Lanka

<sewminijayaweera15@gmail.com>

Abstract - Artificial intelligence (AI) is dominating all domains in the world, and it is attributed both positive and negative impacts in different domains. This article aims to address the nature of the threats of artificial intelligence in education (TAIE) and analyze the awareness of these in society. The main data were assessed by doing a comprehensive literature review, and a quantitative online survey was conducted to gauge the level of public awareness of AI's threats to education. The analysis shows that most people have knowledge about AI technology. At the same time, they have superficial knowledge that AI may poses threats to education, but research reveals that only the minimalists among them have a deep understanding of the negative impacts. According to surveys and reports, school students and undergraduates are misusing many AI-based tools in their academic activities. AI-Based Language Translation Tools, Natural Language Processing (NLP) Tools, Machine Learning Frameworks, AI-Powered Essay Generators, AI Tutoring Chatbots, and AI Virtual Assistants are the major types of AI tools misuse in education. Based on the results, it can be concluded that the rapid development of AI has created considerable challenges for education while also raising concerns about its future. It has posed threats to both teaching and learning. The fact is that most of the students use AI tools without knowing the negative impacts. Students should be made aware of how to use these AI tools in an efficient way to counter the threats posed by artificial intelligence in education.

Keywords – AI, Artificial intelligence, Threats of artificial intelligence in education, public awareness of AI threats

Inventory Management System with Self Assisting Chat bot for Plantation Industry

Kithvin Bandara[#1]

Department of Information Technology Faculty of Engendering and Technology [1]

kithvinbandara1994@gmail.com

Abstract – The inventory management system with a self-assisting chatbot for the plantation industry aims to address the challenges faced in efficient inventory control and monitoring in agricultural settings. The research problem lies in the inefficiencies and manual errors in conventional inventory management systems, leading to increased costs and potential stockouts. The objectives of this study include enhancing inventory accuracy, reducing lead times, and optimizing stock levels to ensure uninterrupted plantation operations. The methodology involves a multi-step approach, starting with a comprehensive literature review to explore state-of-the-art practices in agricultural inventory management and the integration of chatbots in such systems. Data is then collected from various plantations to understand their inventory requirements and challenges. Based on these findings, an intelligent chatbot is developed using natural language processing (NLP) and machine learning algorithms to provide real-time assistance and generate inventory reports. The results demonstrate significant improvements in inventory management efficiency, as the self-assisting chatbot accurately tracks inventory levels, forecasts demand, and suggests optimal reorder points. This has led to reduced inventory carrying costs and minimized instances of stockouts, thereby enhancing overall productivity and profitability for the plantation industry. The discussion highlights the benefits of employing artificial intelligence in the agricultural sector and the potential of chatbots to revolutionize inventory management practices. In conclusion, the inventory management system with a self-assisting chatbot is a promising approach to address the complexities and uncertainties in the plantation industry's inventory management, contributing to the advancement of technology adoption in the agricultural sector and promoting sustainable and profitable plantation practices.

Keywords: Inventory management, Chatbot, Plantation industry, Artificial intelligence, agricultural supply chain.

Enhancing the online dress shopping experience through AI Based solutions

W.G.B.M. Priyankara , J.W.N. Prathibha , H.A. Chamod Dhananjaya, Dhishan Dhammearatchi

(IT Department, Faculty of Engineering and Technology, CINEC Campus) , (IT Department, Faculty of Engineering and Technology, CINEC Campus) , (IT Department, Faculty of Engineering and Technology, CINEC Campus) , (IT Department, Faculty of Engineering and Technology, CINEC Campus)

banithamadu12@gmail.com, nadujay20@gmail.com[#],chamoddhananjaya2000@gmail.com, Dhishan.Dhammearatchi@cinec.edu

Abstract – The Sri Lankan fashion industry has sustained for a very long time and has been successful in serving the local market. One of the biggest industries today struggling with e-business models is the fashion sector. Finding the ideal garment that complements a person's preferences and body shape, skin colour remains a difficult task despite the rapid expansion of e-commerce and online buying. To solve this issue, suggest an AI-based outfit matching method in this research. The researchers found out that AI can quickly solve this problem. The system makes recommendations for appropriate dress options for online consumers after analysing user preferences, body measurements, and fashion trends. A broad dataset of dress photos, user preferences, and body measurements is gathered at the outset of the study. Then, using these data, a convolutional deep network a deep learning model is developed to extract essential properties from dress photos. User input is also taken into account to improve the model's performance over time. The method takes into account a number of variables, such as colour, pattern, style, and body shape, to ensure accurate dress recommendations. The AI model recognizes important visual characteristics using computer vision techniques and evaluates them against the user's preferences and physical characteristics. This procedure results in personalized clothing suggestions from the system, which significantly lessens the hassle and unpredictability of online dress purchasing. User research with a broad range of participants was carried out to assess the effectiveness of the suggested system. The findings show that the AI-based outfit matching system considerably improves user experience by making personalized dress recommendations that fit specific body shapes and preferences. By solving the difficulties of dress matching when buying clothes online, this research makes a contribution to the fields of e-commerce and fashion technology. The proposed AI system shows how machine learning and computer vision can be used to improve the online purchasing experience, lowering the possibility of mismatches and boosting client happiness.

Keywords: AI, online shopping, Dress matching, Personalized Recommendations, Machine Learning

Verification of the criminal sketch by AI Image generation technology

JAYASEKARA M.M.P.L D. P. S. PERERA, BANDARA W.M.S.T

IT Department, Faculty of Engineering and Technology, CINEC, Malabe[#]

Pranamalakshan360@gmail.com,sankalpaconcepts@gmail.com,sahantheekshana65@gmail.com

Abstract - Law enforcement authorities excessively depend on criminal sketches are created by forensic artists based on the eyewitness description. Inconsistencies, subjectivity and the inherent bias of human perception are limitations of these sketches. AI image generation technology provide effective solution to these restrictions by providing data driven algorithms. Deep learning models are used by algorithms to generate realistic images based on a given textual or partial visual inputs. AI image generation verify accuracy of criminal sketches and it increases the standard of the criminal investigations. However, careful attention must be given to the balance between privacy and public safety when using AI generate images for criminal investigations.

Keywords - artificial intelligence, image, generation, criminal, sketches

Disease Identification & Remedy Proposing System for Home Grown *Vegetables*

K.A.Y.A. Kumaradasa[#1], _Mr. N.N. Pollwaththage_[#2]_, and Mr. D. Dhammearatchi_ [#3]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka. [1]*,*

Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka [2]*,*

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[3]*.*

anjaleekumaradasa@gmail.com

Abstract - The "Disease Identification & Remedy Proposing System for Home-Grown Vegetables" project addresses the critical challenge of plant disease management in home gardening through innovative technological integration. The research problem was based to identify plant diseases accurately and the aim was to manage diseases by empowering home gardeners with a user-friendly and intelligent application to identify and treat diseases. Designing and implementing a disease identification and remedy proposing system, analyzing the collected data set, developing a predictive model based on the data collected to optimize crop management and disease prevention practices, and proposing cost-effective remedies were the main objectives of the project. The project had a methodical way to come up with the final output. An extensive literature review was done to find the technologies of the related work. Project architecture was designed to implement a system to identify disease types using image processing techniques. A large diverse dataset of plant disease images was collected to train the models. Tomato, Bell Pepper and Okra were used as the plants to train the models of the system. CNN (Convolution Neural Network) was used as the machine learning algorithm and Keras and PyTorch frameworks were used to build up that CNN algorithms. The system was improved to analyze and classify images uploaded by users into relevant disease categories accurately. API was used to connect the trained models with the mobile application. As a result, the system has the ability to provide a brief description of the diseases, symptoms of the diseases, and the appropriate remedies for those diseases. The effectiveness of the system has been discussed according to the results and trained models were able to demonstrate a high accuracy in identifying diseases. Diagnosing diseases accurately and proposing appropriate treatments illustrates its ability to contribute to a sustainable economy.

Keywords: Image Processing, CNN, Keras, PyTorch, API

Intelligent Delivery Management System with Live Tracking, Safety Monitoring, and Data Analytics

K.K.Sidath Gangajeewa[#1], Mr.Darshana Hettiarachchi[#2], and Mr.Bhanuka Fernando[#3]

Department of Information Technology, Faculty of Engineering, University Wolverhampton[1], Department of Information Technology, Faculty of Engineering CINEC Campus [2], Department of Information Technology, Faculty of Engineering CINEC Campus [3]

<sidathgangajeewa@gmail.com >

Abstract – The "Intelligent Delivery Management System with Live Tracking, Safety Monitoring, and Data Analytics" project seeks to develop an intelligent delivery management system that incorporates real-time tracking, safety monitoring, and analytical data in order to optimize courier services and increase customer satisfaction. The project objectives include researching and identifying the required hardware and software components, designing and prototyping the system, evaluating its impact on delivery service performance, and analyzing the generated data to identify key insights for further enhancements. The proposed system incorporates a variety of components to effectively accomplish its goals. Live tracking utilizing GPS technology enables real-time updates on the location of delivery vehicles and shipments, allowing businesses and customers to monitor delivery progress and obtain precise delivery time estimates. A SMS alerting system is implemented to provide customers with timely updates on their packages, including their location, estimated delivery time, and confirmation of delivery. In order to guarantee the safety of fragile items during delivery, the system employs sensors to monitor environmental factors such as temperature and humidity. This ensures that medications and perishable foods are maintained in optimal conditions throughout the delivery process. Data analytics play a vital role in this system, as it accumulates and analyzes delivery process data, providing valuable insights into delivery performance, package conditions, and other relevant metrics. These insights aid in identifying development opportunities and optimizing the overall delivery process.

Keywords: Intelligent delivery management system, live tracking, safety monitoring, logistics, customer satisfaction.

System for Cleaning Solar Photovoltaic Panels Automatically

K.B. Tennakoon[#1], Vigini[#2], Bhanuka Fernando[#3]

Faculty of Engineering & Information Technology, university of Wolverhamton[1],

Department of Engineering & Information Technology, CINEC Campus Srilanka[2],

Faculty of Engineering and Information Technology, CINEC Campus[3]

<tkalana24@gmail.com>

Abstract - Solar panels extract the energy contained in the sunlight and convert the extracted energy into the energy form of electricity. Since the solar panels are located in outdoor so that they are properly exposed to sunlight, the solar panel surface easily and quickly get unclean. The impurities that cause the solar panels unclean mainly include dust, dried leaves of trees, cobwebs, bird's excreta, dew, other airborne particles etc. Presence of impurities on the solar panel reduces the amount of direct sunlight falling on the panels and hence reduces the power generation efficiency of the panel. Therefore it is very important to mitigate the effects of impurities on solar panels. The main objective of this research project is to design and develop suitable hardware and software that required for a prototype of an autonomous solar panel cleaning robot system. This robotic solar panel cleaning system is controlled by an Arduino based ESP32 microcontroller development board. The determination of when cleaning action should be performed is accomplished by measuring the generated voltage of the solar panel. A rotating roller brush is used clean the surface of the solar panel, whenever the solar panel is generating lower voltage due to deposition of impurities on its surface. A Wi-Fi connected socket server Internet of Things (IoT) based remote monitoring system is established so that the user can observe the information on a web application. An ESP32 IoT camera module is used to capture video stream of the solar panel surface and to upload it to the server with voltage information. Finally it can be concluded that the automatic solar panel cleaning system presented here can be used to increase the solar power harnessing efficiency of solar panels and the IoT enabled web application based monitoring system enables the user to monitor system states remotely.

Keywords: Automatic Solar Panel Cleaning, Internet of Things, Socket Server, ESP32, Remote Monitoring.

Android Application for Skin Cancer Detection System

K.C. Kulathunga[#2] and Mr. D. Dhammearatchi[#1]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[2]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka [1]

kulathungakavindi1234@gmail.com, Dhishan.Dhammearatchi@cinec.edu

Abstract – Skin cancer is one of the most deadly types of cancer. Skin cancer is caused by genetic defects or skin mutations caused by unrepaired deoxyribonucleic acid (DNA) in the body's skin cells. Like other types of cancer, skin cancer has a tendency to gradually spread through other parts of the body. Therefore, skin cancer should be diagnosed better in the early stages because it can be cured by proper treatment methods by identifying it in the early stages. Early detection of its symptoms is a very important step for the ever-increasing rate of skin cancer cases and expensive medical treatment. Due to certain weaknesses and irregularities in these proposed techniques, skin cancer victims are inversely proportional to prompt treatment. That is to say, due to the time management, economic setbacks caused by having to resort to expensive treatment methods, and the uncertainty about the conclusions of diagnoses made through various medical devices, skin cancer patients have a low tendency to undergo these techniques. The sole purpose of this project is to create a suitable Android mobile application for the treatment of skin diseases, keeping the weaknesses of other techniques at a minimum, using the concepts of Imaging Processing and Artificial Intelligence. It is possible to obtain a diagnosis in a very short time by taking a photograph of the skin showing the symptoms of the skin cancer patient and applying it to the test. Also, if the patient is confirmed to be a cancer patient, the convenience of this application is to provide details about the dermatologists in the nearest area.

Keywords – Image Processing, Android, Artificial Intelligence

Using A Combination Of Ai And Vr To Solve Problems In The Architectural Design Modeling

K.M. Amandi De Silva[#1], J.A.D.I. Hansaja [#2], Dhishan Dhammearatchi

IT Department, Faculty of Engineering and Technology, CINEC campus, IT Department, Faculty of Engineering and Technology, CINEC campus#3

amandi123malsha@gmail.com[#1], ihanhansaja5@gmail.com[#2], Dhishan.dhammearatchi@cinec.edu[#3]

Abstract- Virtual Reality (VR) and Artificial Intelligence (AI) are human – computer interfaces that are being used at present. Everyone knows about AI but, with the rise of AI technology, the VR technology has been suppressed. Using a combination of these two modern technologies can implement Intelligent Virtual Environments (IVE) that help to improve the architecture and design field. However, there are some issues when it comes to the real implementation of IVE in the architecture field. Insufficient computing power, ambiguous ideas to the customer about the actual application of their conceptual idea, lack of three-dimensional (3D) graphics power are the issues that can be badly affected to the architectural field and user's satisfaction. Both primary and secondary resources which contain information related to these issues are used for finding a solution. With the evolution of technology and computing power, these issues can be solved, and the combination of AI and VR technologies has become possible. AI algorithms can analyze historical designs and implement new designs, newly implemented designs can be visualized using AI- powered VR technology. The continuous growth of computing power and development of 3D graphics power minimized issues when combining these technologies and it became easier to learn, VR Environment building softwares like Unity and Unreal Engine. These functions can visualize to the user via IVE that use a combination of AI and VR to get an unambiguous idea. Since the stone age to the age of AI humans have done amazing architectural designs. This research paper emphasizes an introduction to how AI and VR combine to power up the field of architecture and how future technology will evolve this field.

Index Terms— Artificial Intelligence, Virtual Reality, Architectural design, Intelligent virtual environment, Computing power, Graphical power

Find Your Vein: Online Blood Bank

K.W.A.N.M. Kandewaththa and R.M.C.L. Rathnayake[#]

Department of Information Technology and Faculty of Engineering and Technology[1], Department of Information Technology and Faculty of Engineering and Technology[2]

arunikandewatta98@gmail.com , chandimar.online@gmail.com

Abstract: "Find Your Vein - Online Blood Bank" is a transformative research project aimed at establishing a comprehensive blood supply network, addressing critical challenges in the current blood donation and distribution system. Leveraging advanced technology, this project aims to bridge the gap between hospitals, blood donors, and those in need of blood, ultimately saving countless lives. The primary objective is to connect all hospitals through an innovative online platform. This centralization, accessible to authorized medical personnel, enables coordination of blood requests and supplies. The interconnected network facilitates efficient blood distribution, ensuring swift access to blood during emergencies. Additionally, the platform links blood donors to the system, allowing them to register and provide information like blood type and location. This feature ensures a readily available pool of potential donors, ready to fulfill urgent blood requirements promptly. An aspect of the project is the real-time blood storage report system. Hospitals connected to the platform update their blood inventory regularly, and this information is collated and analyzed to generate comprehensive knowledge reports on blood storage status. These reports aid in identifying potential blood shortages, enabling proactive measures to avoid critical supply gaps. Furthermore, the system actively monitors hospitals facing insufficient blood storage levels. Hospitals with low blood inventory receive prominence on the platform, triggering notifications to nearby blood donors and relevant authorities. This approach fosters a sense of urgency and community involvement, encouraging timely blood donations and effective blood management. In conclusion, "Find Your Vein - Online Blood Bank" seeks to establish an interconnected nationwide blood supply network, overcoming current challenges in blood donation and distribution. By leveraging advanced technology and fostering community engagement, this project aims to save lives during emergencies and ensure an efficient and reliable blood supply for those in need across the country.

Key words: Find Your Vein, Nationwide blood supply network, Real-time blood storage reporting, Online Blood Bank, Hospitals, Saving lives, Blood shortages, Swift access to blood.

Real-time Identification and Enumeration of Blind,Dumb and Deaf Preschoolers with Python Web Based Application System

L.T.G.H.T.Eranga[#1], Maduwanthi Uthpala[#2]

BSC(Hons) Computer Science (Software Engineering) (Top up) (Batch 08),

Department of IT

Faculty of Engineering & Technology, University of Wolverhampton UK

Wulfruna Street, Wolverhampton,WV1 1LY,United Kingdom

tharakaeranga96@gmail.com   maduwanthi.uthpala@cinec.edu

Abstract – The absence of effective and precise identification and enumeration procedures for blind, dumb, and deaf pre-schoolers is the research topic this study attempts to solve. A Python web-based application solution is suggested to address this problem, concentrating on real-time detection utilizing AI and offering insightful data to educators and decision-makers. The goals of this project include creating an intuitive system for quick identification, putting real-time identification methods based on AI into practice, allowing precise tracking and enumeration, and promoting the mental health and well-being of the recognized youngsters. The system also intends to improve student learning, advance inclusion, and protect sensitive student data for identification that respects privacy. The SDLC prototype process was chosen for system development because it allows for quick iterations and user input, which results in improved solutions and fault identification. Primary sources like surveys and interviews will be used to collect the data, as well as secondary ones like websites, health records, and preschool records. In conclusion, the suggested Python web-based application system aims to enhance the identity, academic performance, and mental health of blind, deaf, and dumb pre-schoolers while offering insightful information to others. It intends to promote inclusion and lessen social distance, which will improve educational experiences and ease problems with resource allocation.

Keywords: blind pre-schoolers, dumb pre-schoolers, deaf pre-schoolers, Python web-based application, real-time identification, computer games, data acquisition, mental health.

Automated Positioning and Real-Time Review for Indoor Mobile Coverage Testing

Suminda Sampath Abeysiri[#1], Dharshana Hettiarachchi[#2], Bhanuka Fernando[#3]

Department of Information Technology, Faculty of Engineering, CINEC Campus[#1], Department of information Technology, Faculty of Engineering, CINEC Campus[#2], Department of information Technology, Faculty of Engineering, CINEC Campus[#3]

Suminda242@gmail.com[#1]

Abstract – The rapid development of the telecommunications industry requires improved testing procedures for both indoor and outdoor signal coverage. While testing outdoor coverage, locations depend on the Global Positioning System (GPS). Due to the difficulties of acquiring accurate GPS signals inside the structures, indoor coverage testing is particularly challenging. An automated indoor positioning technique is required since there are discrepancies in manual pinpointing procedures. By creating an Automated Positioning and Real-Time Review System for Indoor Mobile Coverage Testing, this project aims to overcome the above issue. The proposed system provides precise position identification inside the buildings by using a wireless tag system. Prior to starting the indoor test, tags with pre-defined measurements are placed inside the building. For bigger rooms, extra tags or high-power tags are used. Data collection from tags and a mobile signal-picking module is done by the microcontroller. Both location information and coverage data are included in this data. Using cellular data or Wi-Fi, this information is sent to a PC application to monitor in real-time. The study evaluates different indoor positioning techniques to obtain the required accuracy and determine the best strategy for optimal performance. Additionally, it creates a reliable mechanism for gathering and storing real-time signal strength and position data from the artefact. To improve the effectiveness and user experience of the testing process, the project will be extended in the future to include the building of a mobile application in addition to the PC application. In conclusion, this project addresses the important issue of real-time monitoring and automatic positioning during indoor mobile coverage testing. The development of an accurate system that integrates accurate position and signal level data provides a foundation for improved indoor coverage testing methods. The telecom industry can benefit a lot from the findings and solutions from this research, which will also improve the accuracy of predicting indoor mobile coverage.

Keywords: Telecommunications, Indoor Positioning, Mobile Coverage Testing, Wireless Tag System, Real-Time Monitoring

Integrated Automated system for the advancement of Sri Lankan Healthcare Industry

LNNA De Silva [#1]

Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka[1]

[#]<39-adc-0006@kdu.ac.lk>

Abstract – Since the initial establishment of the public healthcare system in 1951, Sri Lanka has maintained a constant commitment to providing free healthcare services to its entire population of citizens through a government-managed healthcare system. Despite technological developments, the nation still relies on manually maintaining records for medical information regarding patients and data, conveying a barrier to fully integrating cutting-edge technology within the healthcare industry. The method proposed effectively collects data about patients, physician profiles, appointment records, and prescription records through the utilization of upgraded database management systems, resulting in an improved, and more advanced approach. A variety of advantages related to this system are addressed in this paper, including enhanced data management, quick patient care, easy scheduling of appointments, automated processing of payments, data-driven decision-making, and smooth communication with governmental platforms, the system also includes an email notification and reminder feature to guarantee adherence to prescription procedures and appointments. Healthcare administrators and professionals can collaborate in real time because of the user-friendly interface. Along with the worldwide tendency to evolve toward electronic medical record systems, integrating such advances into Sri Lanka's healthcare system through the Medical Facility System is an important phase toward upgrading healthcare practices and bringing them into accordance with globally active healthcare trends. The objective of this paper is to examine the repercussions and consequences of implementing an upgraded medical facility system that utilizes advanced database management technology in the Sri Lankan healthcare industry. By implementing this framework, the country's medical industry will be able to comply with global standards, upgrading the healthcare management systems to greater heights.

Keywords: Sri Lankan Healthcare system, Electronic medical records, Digitization, Data-driven decision-making

Factors Associated with the Customer Adaptation to Mobile Banking in Government Banks, Sri Lanka

LVSD Karunarathna[1#], TUS Senarath[2], LI Manorathne[3]

[1,2]Department of Information Systems, Faculty of Management Studies, Rajarata University of Sri Lanka.
[2]https://orcid.org/0009-0001-6971-1148
[3]Department of English, Faculty of Humanities and Education, CINEC Campus, Millenium Drive, IT Park, Malabe, Sri Lanka.
[3]https://orcid.org/0009-0001-8153-5212

[#] dananjayaskarunarathna@gmail.com | +94 (71) 953 8009

Abstract- In the modern era, electronic banking processes are widely used by most banking institutions, replacing traditional banking methods. Studies have revealed that Sri Lankan customers have various thought processes related to m-banking. This study aims to identify the factors that influence customers' adaption of mobile banking in Anuradhapura district, Sri Lanka. The financial cost, social influence, awareness, and ease of use were chosen as variables to measure the influencing factors of customer adaptation to mobile banking. To collect primary data, a structured questionnaire was distributed to 150 sample respondents from five banks in the Anuradhapura area. Descriptive statistics, correlation analysis, and regression analysis were used to analyze the gathered data correspondingly. The study findings demonstrate that customers' adaption of mobile banking in government banks in Anuradhapura district, Sri Lanka is highly influenced by the financial cost, social influence, awareness, and convenience of use. Customers in Anuradhapura district have a high level of usage of Internet banking services. The study, similarly, found that four factors including financial cost, social influence, awareness, and ease of use - significantly influenced the adaption of mobile banking in the Anuradhapura district of Sri Lanka. In summary, this study helps to identify the factors that contribute to customers' adaption of mobile banking in Anuradhapura district, Sri Lanka. By recognizing the key determinants, banking institutions, and policymakers can focus their efforts on increasing adaption rates and making mobile banking more accessible to customers. The study's findings can also be advantageous for future research in the area of mobile banking adaption in other regions of Sri Lanka and beyond.

Keywords: Financial Cost, Social Influence, Awareness, Ease of Use, Customer Adaptation to Mobile Banking

A Smart Pole for Remote Paddy Field Monitoring with Intruder Detection and Prevention & including Analytics Features.

M.D.T.K.Ranasinghe[#1], Mr. N. N. Pollwaththage[#2], and Mr. D. Dhammearatchi[#3]

Department of Information Technology,
Faculty of Engineering, CINEC Campus (Pvt) Ltd,
Millennium Drive, IT park, Malabe, Sri Lanka [1],

Sri Lanka Telecom PLC,Lotus Road, Colombo 01, Sri Lanka[2],

thusitha1992ranasinghe@gmail.com [1]

Abstract - The use of technology in agriculture underwent a significant recent change, adding complexity to agricultural routines and practices. Therefore, this study proposed using Internet of Things (IoT) technology to identify and prevent intrusions in paddy farming processes, alongside enhancing productivity through analytical capabilities. It examined the creation of an IoT-based monitoring and management system for paddy fields. In this proposed system, farmers and farm controllers could remotely oversee fields and receive intrusion alerts. The system aimed to achieve intelligent and efficient field monitoring using budget-friendly wireless technology, integrated with IoT features catering to field management and security requirements. Installed sensors collected real-time data wirelessly, and the system analysed this data before transmitting it to users. Users could then deduce potential future field conditions through a web page. Data including soil moisture, temperature, rain levels, and wind levels were acquired through sensor technology. Additionally, wireless sensors, lights, and camera modules facilitated real-time monitoring of paddy fields and the detection of threats. Information gathered via sensors was pre-processed to anticipate possible field effects and diseases. This same data was presented in an organized manner, enabling farmers to remotely monitor vital information. The outcome was the integration of sensors and devices with wireless communication technology, enabling real-time data transmission to a central server. This integration also involved creating a user-friendly interface allowing farmers to remotely oversee their fields, receive alerts for parameter breaches or intrusions, and analyze collected data to identify intrusions. Moreover, the approach resulted in reduced labor costs, heightened crop yield, and enhanced safety. Ultimately, this study emphasized technology's role in encouraging agricultural efficiency.

Keywords: Internet of Things (IOT), Smart pole, Data Analytics, Environmental Monitoring, Real-time alerts, Wireless communication, Cloud-based platform

LP Gas Monitoring System

Kaleelur Rahman

BSc (Hons) in Software Engineering, CINEC Campus, Sri Lanka, University of Wolverhampton

kaleel.rahman915@gmail.com

Abstract-The LP Gas Monitoring System is an innovative mobile-based application designed to address the inefficiencies in LP gas monitoring, aiming to enhance safety and reduce wastage. The project's main objectives are to provide real-time gas level data to users, facilitate seamless communication with nearby gas sellers, and promote gas safety awareness. To achieve these goals, a mixed-methods approach combining qualitative and quantitative methodologies is adopted. The project involves developing a user-friendly mobile application with a secure backend infrastructure for data storage and retrieval. Rigorous real-world testing validates the system's functionality, usability, and effectiveness in providing accurate gas level data and safety alerts. The results and discussions highlight the LP Gas Monitoring System's success in empowering users to monitor and manage their gas usage efficiently. The system enables direct communication with nearby gas sellers, streamlining the gas ordering process. User feedback underscores high satisfaction levels with the application's convenience and safety features. In conclusion, the LP Gas Monitoring System effectively tackles the research problem of inefficient LP gas monitoring by delivering real-time data, enhancing gas safety practices, and optimizing gas resource management. The system's positive impact on households and communities is expected to promote gas safety awareness and lead to better resource utilization.

Keywords: LP Gas Monitoring System, real-time data, gas safety, mobile application, gas ordering, resource management.

Applying the APE GOVI Web Application, paddy farmers and wholesalers may communicate more effectively.

Mohamed Kaleel Mohamed Aadhil [*]

BSc (Hons) in Computer Science (Software Engineering)

Undergraduate, Faculty of Science and Engineering, University of Wolverhampton UK

[*]*Corresponding Email:* aadhilkaleel@gmail.com

Abstract-In many areas, especially those where rice production is the primary agricultural activity, the agricultural sector is essential to providing food security and economic stability. The affluence of paddy farmers and the sustainability of the rice supply chain are, however, constrained by a number of concerns, such as information asymmetry, market inefficiencies, and crop management problems. The "APE GOVI" online application was developed and put into use in this study report to address these issues and close the gap between paddy farmers and wholesalers. The application offers a user-friendly interface for both farmers and wholesalers by utilizing cutting-edge web technologies like Node.js, React Native, and React.js. In order to anticipate future output levels based on historical data, APE GOVI also uses cutting-edge machine learning methods through neural networks. The target audience will be impacted in a variety of ways by the APE GOVI web application. The features of the program generate career chances that are advantageous to young people in agricultural areas. The development, implementation, and predicted effects of APE GOVI are described in this study report, paving the way for paddy farming communities to enjoy a more prosperous and sustainable future.

IoT-based kitchen raw food container integrated with supermarket grocery management system

M.L.S. Deshappriya#1, Mr. N.N. Pollwaththage#2, and Mr. D. Dhammearatchi#3

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka.1,

Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka 2,

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka3.

deshapriyasandun@gmail.com1,

Abstract - The integration of an Internet of Things-based kitchen Raw Food Container with the inventory management system of a supermarket has been detailed in this project report. The purpose of this project was to design a complete solution for improving administration and ordering the kitchen raw food in effective time saving manner via interrogating with supermarket grocery management system. This solution was to include both a mobile app for users and a web portal for grocery shops. The system utilized Internet of Things (IoT) technology to enabled users to monitor the levels of items in the kitchen raw food container. When the food item in the container goes below the 50% of total depth of the container, the user can order the food via Mobile App was developed as part of the project. The Ultra Sonic Sensors have been used to the measure the available food quantity furthermore, a web portal which was developed using Laravel frame work for supermarkets to manage the inventory and track the supply of groceries and automated filling of ordered raw food quantity. The central database has been given a centralized platform for integration of both kitchen food container and supermarket. The utilization of IoT technology has been accomplished via ESP 32 module was the key of this project. Results were gives that reduced amount of raw food quantity can refilled at supermarket automated system when it orders. The intention was to use this technology to improve the efficiency and ease of kitchen raw food management for grocery shops also individual customers in their busy life. This all-encompassing solution provides an integrated strategy for addressing many facets such as monitoring, ordering, and inventory operations in an efficient manner. The system can also suggest alternatives from e-commerce sites for consumers to order the required products effectively.

Keywords: IOT, Android Mobile App. Laravel based Web portal. Ultrasonic Sensors. ESP 32 Module

Online Shopping offer market place (web site)

M.A.Charith Sandeepa[#1], Ms. Anuththara[#2]

BSC(Hons) Computer Science (Software Engineering)(Top up)(Batch 08),

Department of IT

Faculty of Engineering & Technology, University of Wolverhampton UK

Wulfruna Street,Wolverhampton,WV1 1LY,United Kingdom

Charithmeegalla@gmail.com

Abstract – Irrespective of age, all of us have resorted to online shopping but still there are many drawbacks. Among them, many difficulties such as being deceived by fake imitations, increasing the distance to the relevant store, difficulty in changing defective products, not being able to get a product at a good price, etc. can be avoided by this website that we introduce here. Here, web solutions have been provided for all these problems. And with this project we hope that with everyday people's busy lives they spend a lot of time shopping for the things they need so that they can manage their time. A good value product for the money they spend. And this project is expected to be completed within a short period of 6 months and arrangements have been made to use html, css and AI for this purpose. HTML, CSS, and JAVASCRIPT are used for the front-end and back-end of the website And AI has been used to smartly show customers the products they think will be available in the future. This website first shows us the nearest stores where we can get the products we want. You will see many free items first. Due to this, most of the above problems are solved and we also get the facility of getting the required product at a very low price from a responsible trade.

Keywords: e-commerce website, shopping, online shopping, Python, web-site, html, fashion, e-money, offers, selling item, buying and selling.

LAN Port Monitoring System & Fault Detection System

M.A.V.M.S.Fernando[#1,] Dharshana Hettiarachchi [#2] Bhanuka Fernando [#3]

Faculty of Science & Engineering, University of Wolverhampton[1], Department of Information Technology, CINEC Campus[2], Department of Information Technology, CINEC Campus[3]

<ceylon.vms@gmail.com>

Abstract- With the current situation in Srilanka, it is necessary to think twice or more before making a decision to visit a site or a customer location for the mentioned types of faults due to the higher rates for transport. It sounds easy when supportive IT staff is available at the customer's end or Nodes for this kind of fault. When it's not, to visit the location just to give a power reboot to the Out Door Unit (ODU) and the Router. To identify this kind of issue, do interviews with Transmission Engineers in relevant fields such as Telecommunication and Transmission. Also, the Network Operation Center (NOC) team will be happy to have this type of system because guiding someone who doesn't have enough literacy is a bit difficult and there is a risk of unwanted disturbance to other parties. The implementation of remote Power over Ethernet (POE) monitoring and the power reboot system based on SMS alerts and SMS codes This SMS alert will be received when it changes the state of the threshold value, and the reason for using SMS is its availability and higher stability than other technologies. When the NOC receives this alert for the monitoring device (Mobile Phone), just have to send the "Reboot" text rather than calling and asking someone to go visit and advising them to do the power reboot and the relevant device gets rebooted when it receives the command. If it gets success from the reboot, it will send the current state of the LAN port. If it does not succeed, this device will generate another alert for it, and then the NOC will have to raise it for further rectification. This will minimize the downtime or latency toward customers, which means higher reliability, and reduce the uncomfortableness for the NOC team where unsupportive staff are available. Consider how useful this device is during difficult or inaccessible times, such as heavy rain and at night. Also, it saves a lot of money for a company.

Key Words: LAN Port Monitoring System, Smart POE Adaptor, Remote POE System

Seizure Alert Device for Epilepsy Patients

M.T.T. Prasad[#1], A.M.R. Eshandi[#2], M.V.M Jayathilaka[#3]

Colombo International Nautical and Engineering College (CINEC)[1]

thulithaprasadedu2020@gmail.com [1]

Abstract - In spite of receiving medical therapy, 30% of the more than 50 million people who have epilepsy will continue to experience seizures. There are various tools that can find seizures. But those are pricey gadgets. Sri Lanka, a poor nation, cannot afford to pay that much for the medical industry. The developer made the decision to make a wearable device that the Sri Lankan medical industry could afford. The developer studied a lot of publications and conducted extensive research. Following reading those documents, the developer has some queries and thoughts. The developer then had the idea to make a seizure alert device by using IoT technology and sensors for those suffering from epilepsy. Developer has identified important features and needs that enhance the device's effectiveness and cost through thorough study and a thorough assessment of the body of current literature. The Seizure Alert Device may be developed at a fraction of the cost of existing high-end seizure detection systems by utilizing cost-effective components and incorporating the most recent developments in sensor technology. The Seizure Alert Device offers advantages to several stakeholders. The gadget offers epilepsy sufferers a dependable method of ongoing monitoring and early notice of seizure episodes, enabling them to seek quick medical assistance and take the necessary precautions for their safety. Being immediately informed during urgent situations gives patients' parents or guardians peace of mind and enables them to offer assistance and care in good time. Researcher intend to close the accessibility gap to cutting-edge epilepsy treatment technology by developing a cost-effective Seizure Alert Device customized to the distinct demands of Sri Lanka's medical sector. The device's low cost paves the way for democratized access to fundamental medical services, empowering both patients and medical professionals. Developer thinks that this idea has a great deal of promise to enhance the lives of epilepsy sufferers in Sri Lanka and other areas of the world with limited resources.

Keywords – Seizure, Epilepsy, Sensors, IoT

Developing a mobile app to provide quality and efficient service and a superior travel experience to all local and foreign tourists.

T.N.Galagedarage, V.K.U.Madusanka, P.A.A.D.S.H.Dias, Sewmini jayaweera [#]

(Department of Information and Technology, Faculty of Engineering and Technology, CINEC Maritime Campus)

thulajiniranjana@gmail.com , udaramadu19980823@gmail.com, 2067hsandeep@gmail.com, sewminijayaweera15@gmail.com[#]

Abstract-Sri Lanka is a country full of beauty that attracts both local and foreign tourists. So, we aim to develop a mobile app for the convenience of all the tourist who come to see the beauty of Sri Lanka. Through this app you can get the information about the beautiful eye-catching places and historical places to visit in Sri Lanka. An also can get the information about the lodges/hotels that are suitable for staying the tourists in different areas of Sri Lanka. So, all these information included in one application and it would be really helpful for every tourist to travel around the Sri Lanka easily. Also, through this mobile app, anyone who used it, will be able to gain more information about the tourist spots in Sri Lanka. Through a combination of surveys, focus groups and through the Google we used to find the data to develop this mobile app. Results indicate that the app considerably improves the vacation experience by providing information on Sri Lanka's lesser-known aspects of culture and landscapes and by encouraging ethical and sustainable tourism activities. However, difficulties still exist, such as the requirement for dependable offline functionality given network limitations in some areas of the island and making sure content is accurate and up-to-date. In conclusion, the creation of a travel app specifically for Sri Lanka has the potential to fill knowledge gaps, advance intercultural understanding, and increase local tourism income. Future iterations should incorporate more local communities and make use of cutting-edge technologies to create a genuinely immersive Sri Lankan experience for maximum impact.

Anti-Static tape detection door unlocking system for data centers.

M.H.B.N.L. Wanninayake, Mr. N.N. Pollwaththage[#2], and Mr. D. Dhammearatchi[#1]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka,

Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka [#2],

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka [#1]

nimesh.wanninayake@gmail.com, npollwaththage@gmail.com[#2], Dhishan.Dhammearatchi@cinec.edu[#1]

Abstract - This research project presents smart door unlocking system for data centers, along with an anti-static tape detection system, using Open CV in python. The project aims to reduce the effect which can be made by static current while working with the server configurations at the data centers. A camera is placed near the door at hand level to capture the anti-static tape. Hence, the system can identify whether the tape is wear properly or not. If the person who enter the data center is wear properly the anti-static tape the system grant the permission to unlock the door. Else deny the access and further it provides anti-static tape. The system includes 6 main parts which are Camera, Trained Neural network, Microcontroller (Arduino ESP8266), door lock and anti-static tape distribution system. The literature review of this research highlights the significance of image processing, secure entry system into data centers, and reduce the damage which would be occurred by third party persons for sensitive equipment in data centers. The methodology involves the use of modular designs, tensor flow, Keras, Open CV, data sets, python, sigmoid function and Softmax function effectively. The implementation of the artifact includes anti-static tape detector using python, cording the Arduino according to the results of the AI system, servo motors for door unlocking system and tape distributor and the integration of the firebase for data storing. The research identifies areas for future improvement, such as modify the system to detect the availability of the tape during the entire period.

Keywords – Open CV, Keras, Tensor flow, Neural Network

Enhancing Healthcare Access in Sri Lanka:

Assessing the Viability of Drone Technology for Delivering Emergency Medicines to Remote and Rural Areas

Mphp Karunadasa[#1], Ngdm Udayakantha [#2] And Jis Jayaweera

Department of information and technology, Faculty of engineering and technology, CINEC Campus

<*himanga2000@gmail.com , dilukedu@gmail.com*>

Abstract: All around the world, Access to life-saving and critical health supplies, such as blood and medicine delivery to hospitals is hampered. This looks into the potential use of drone technology to improve healthcare accessibility in Sri Lanka, particularly in remote and rural areas. The goal of this study is to evaluate the feasibility, efficacy, and difficulties of using drones to deliver important emergency medications to places that would otherwise be difficult to reach and even though deliver to the places near without anyone coming to hospitals. Especially this study is to examine about the benefits and drawbacks of using Drone Technology for Delivering Emergency Medicines to Remote and Rural Areas in Sri Lanka. Another objective is to conduct a survey and try to understand the perspectives of people in Sri Lanka about using this Drone Technology for Delivering purpose in Sri Lanka. The study examines the cost-effectiveness, safety, and regulatory elements of incorporating drone technology into the healthcare supply chain, with the ultimate goal of providing policymakers, healthcare professionals, and stakeholders with evidence-based insights. This research contributes to the ongoing discussion about creative ideas to improve healthcare services and accessibility in Sri Lanka by evaluating the possible advantages and downsides of using drones for medical delivery. The study's findings have the potential to alter healthcare delivery systems and bridge the gap between medical resources and populations in distant and rural places.

Keywords: Drone Technology, Rural Areas, Emergency Medicines, Blood

Helmet Detection System for ATM Security: Enhancing Surveillance and User Safety

N.N. Wijayakumara[#1], Ms. M.V.M. Jayathilake [#2], and A.M.R.Eshandi[#3]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus1, Sri Lanka Institute of Advance Technological Education2, Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus [3]

nnikini9@gmail.com [#1], mekala@sliate.ac.lk [#2], eshandi.amr@cinec.edu [#3]

Abstract – Automated Teller Machines (ATMs) are vital components of the modern banking system, providing easy access to financial services for millions of people around the world. The use of helmets in ATM cubicles raises growing concerns, which has implications for proposed solutions to enhance security in ATMs. The security of these ATMs is a prime concern due to their vulnerability to criminal activities. A review of the data collection conducted for the ATM users, bank staff, and security personnel reveals that 75% of incidents involved people wearing helmets in ATM environments. This study proposes a helmet detection system that addresses this problem using the Python programming language and the YOLO algorithm of the PyTorch library. The objective is to develop and implement a real-time helmet detection system with accurate response capabilities. The goals include proper identification of helmets at ATM cubicles, requesting people to remove their helmets, and alerting security officials in case of non-compliance. An SMS alert is sent to security officers if the helmet is not removed within a predetermined time, allowing for immediate intervention. Security personnel are equipped with RFID cards that allow them to unlock the keypad or send a message to the police. This system can be extended to detect other suspicious equipment or concealment items, including weapons, masks, and hoodies, by incorporating facial recognition technology. This would further enhance security and prevent unauthorized access. Additionally, a vibration sensor can be added to the ATM, along with a one-time password (OTP) feature for mobile devices to unlock the ATM keypad. The proposed system develops a comprehensive and effective ATM security solution by integrating image processing, RFID technology, and SMS notification. This technology improves overall ATM security, discourages criminal activity, and increases confidence among ATM users.

Keywords: Helmet Detection, ATM Security, Image Processing, RFID Technology, SMS Alerts

Advantages and Improvements in Architectures and Systems for Plagiarism Detection

N.*K. Wijayasingha (IT Department, Faculty of Engineering and Technology, CINEC), D.M.S.N. Disanayaka, J.M.R. Samadara*
nethmiwijayasingha@gmail.com
surandidm@gmail.com
rashmisamara1123@gmail.com
<Mr. Dhishan Dhammearatchi, Dhishan.Dhammearatchi@cinec.edu >

Abstract- Plagiarism is the act of presenting someone's idea, text, or part of a system as your own without giving them due credit. At present, the information published on the websites and the books' texts is misused for plagiarism. The effect has become a problem in many fields. Research has also revealed that this process, which has been going on for a long time, has increased with the advancement of technology. This can often happen due to ignorance, reluctance to do a task or laziness. Doing this continuously, whether unconsciously or consciously, can lead to certain problems. Consequences of plagiarism may include academic disfavor for plagiarizing students, professional discredit at work, legal problems and punishment for plagiarism, and financial penalties for offenders. With the increase in plagiarism comes the need for identification. Currently, various pieces of software have been created for this purpose. As the study approaches this research, it examines the advantages and improvements of detection systems, focusing on these plagiarism detection methods and the software used to detect them. Current research shows that these systems work best for a specific language, and the system's performance changes according to the relevant sources. The results show that, according to these, some systems cannot detect plagiarism through existing AI tools, and the detection of sources in specific languages (such as English) is easy but difficult in other languages. In addition, the advantages of plagiarism detection systems are that they can detect plagiarism without spending resources; because plagiarism is done and assignments are made, those problems can be minimized, and it is easy for teachers and lecturers to identify it. According to the findings of this research, there are some consequences of plagiarism with or without awareness, and the existing problems, possible improvements, and advantages of those systems have been discussed.

Keywords - Plagiarism, AI tools, source detection, detection systems

The Significance of Physical Teaching Process: A Study of Irreplaceability of a Teacher with an Artificial Intelligence Environment

N.N. Vibhusha Gangulel[#1], N.N. Sethmal Didulana[#2], T.A.M. Nuwanthi Siriwardhana[#3], and Dhishan Dhammearatchi[#4]

(Department of Information and Technology, Faculty of Engineering and Technology, Cinec Maritime Campus)

vibhushananayakkara@gmail.com , sethmaldidulana@gmail.com , nuwanthimeghana@gmail.com , Dhishan.Dhammearatchi@cinec.edu

Abstract- The aim of this study is to emphasize the effectiveness of physical learning and why Artificial Intelligence can never overcome the role of a teacher. In this digital world, Artificial Intelligence has already dominated each and every aspect of the future of modern technology. There are applications and websites that have been encoded with Artificial Intelligence that do the exact same thing as many professionals do, especially for a much lower price. This has influenced the future job market leading to unemployment but there are some job industries like Teaching industry, untouched by Artificial Intelligence. Data was collected through a survey and secondary sources published officially including journals. The analysis depicts that this has already affected the wages, income inequality and the growth of the economy of many countries. As a result of this many industries don't recruit additional employees and that has led to unemployment which is highly visible in well developed countries like the United States of America. Over 95 percent of students use Artificial Intelligence in their day-to-day life. Artificial Intelligence does not have the potential to identify the emotions, attitudes of a living human and as a result of that the teaching industry is not being invaded by it. Teachers are the main pillars that guide students to their success. The results show that teachers use so many psychological tricks to mold students by understanding the psychological level of each student. According to the survey results, 81.5 percent of students request physical teachers in their academics. During the covid pandemic season, the downfall of the student development not only in academics but also in attitudes was highlighted although there were online classrooms. The research findings suggest that an algorithm can never be implemented to identify the standards of a student but it can be used to get support in navigating and expanding knowledge.

Keywords: Artificial Intelligence, Job Displacement, Child Psychology, Teaching Industry, Automation

The Integration of Machine Learning and Business Digitization: Unleashing the Power of Data

Nipuna Sankalpa Thalpage

Cardiff School of Technologies, Cardiff Metropolitan University, Cardiff, UK[1]

<st20197059@outlook.cardiffmet.ac.uk >

Abstract – This conceptual review addresses the integration of machine learning (ML) and business digitization as a pivotal solution to today's evolving business landscape. The research problem centers on the need to leverage data-driven strategies and ML techniques for optimal decision-making and market adaptability. The primary objective is to explore how ML can revolutionize decision-making processes within the context of digitization. The review employs a comprehensive methodology, analyzing case studies, theoretical frameworks, and industry best practices to illustrate the transformative potential of ML integration. It highlights the value of ML-driven insights in enhancing customer experiences, optimizing operations, and personalizing offerings. Python's role in facilitating ML implementation is also examined.Results indicate that ML integration empowers businesses to uncover hidden patterns and trends, enabling data-driven decision-making across diverse sectors. Additionally, the study showcases the potential of AutoML, IoT integration, and Edge Computing for innovative solutions. By elucidating AI and ML applications in various domains, the paper reveals their profound impact. In conclusion, this review underscores the critical role of ML in propelling businesses towards sustainable growth and innovation. The strategic integration of ML with digitization allows organizations to harness the power of data for informed decision-making and adaptability in a dynamic market environment.

Keywords: Machine learning, business digitization, data-driven decision-making, Python programming, AutoML, integration, innovation, digital transformation

Exploring the development of smart cities in Sri Lanka: prospects challenges and best practices

Nvbs Sijantha[#1], Mphp Karunadasa[#2], Vgap Sankalpa[#3] And Ngdm Udayakantha[#4]

(Department of information and technology, Faculty of engineering and technology, CINEC Campus)

<shanodh6262@gmail.com, himanga2000@gmail.com, achithapasan1234@gmail.com, dilukedu@gmail.com>

Abstract – As urbanization accelerates globally, the concept of smart cities has emerged as a promising solution to address the challenges of sustainable urban development. This research aims to explore the development of smart cities in Sri Lanka, focusing on the prospects, challenges, and best practices associated with their implementation. The primary objectives of this study are to investigate the current state of smart city initiatives in Sri Lanka, identify the key prospects and opportunities they offer, and analyze the obstacles and challenges that hinder their successful implementation. Additionally, the research aims to uncover best practices and lessons learned from similar projects worldwide that could serve as valuable insights for Sri Lanka's smart city journey. To achieve these objectives, a mixed-methods approach was employed, including a comprehensive literature review, interviews with key stakeholders, and analysis of existing smart city projects in Sri Lanka and other countries. The study evaluates various aspects of smart city development, including infrastructure, technology integration, governance models, citizen engagement, and sustainability considerations. The findings reveal that Sri Lanka has made significant strides in its pursuit of smart city initiatives, with notable prospects in improving urban mobility, energy efficiency, and citizen services. However, the research also identifies several challenges, such as limited financial resources, regulatory hurdles, data privacy concerns, and the need for capacity building and skill development. Drawing from successful smart city projects around the world, the research identifies best practices that align with Sri Lanka's unique context, offering valuable recommendations to overcome existing challenges and enhance the prospects of successful smart city implementation. In conclusion, this research sheds light on the evolving landscape of smart cities in Sri Lanka, presenting a comprehensive assessment of the prospects, challenges, and best practices involved in their development. The findings provide a valuable reference for policymakers, urban planners, and stakeholders involved in shaping Sri Lanka's future urban landscapes, emphasizing the importance of sustainable and inclusive smart city solutions for the nation's growth and prosperity.

Keywords: Smart city, Sri Lanka, Urban Development.

TestMezure - A Comprehensive Test Management Application

P.S.J. Perera#1

Department of IT, University of Wolverhampton,UK

Department of IT , Cinec Campus , Malabe

S.J.Pathiranage@wlv.ac.uk

Abstract- Accessible and efficient test management tools are vital for software quality assurance (SQA). However, high costs, sub-par open-source options, the absence of a dedicated SQA community, and a lack of comprehensive, beginner-to-expert educational resources present significant challenges in the field. This research seeks to address these obstacles for improved SQA processes and tools. The Objective is to develop an accessible, open-source test management web application and mobile application that promotes learning of QA, enables robust testing procedures, facilitates user collaboration, and streamlines overall QA processes for efficiency in software development. The research entails a literature review, assessment, benchmark study and a comparative study of existing test management tools, industry requirement , current problems software quality assurance process, followed by the design, development, and iterative refinement of an open-source test management application based on gathered insights. Usability and pilot testing of the application will be conducted with Quality Assurance practitioners and experts, utilizing their feedback for continuous improvement and final refinement before launching the application to a wider audience. The research identifies key features essential for a comprehensive, open-source test management software to meet industry requirements: functionality for both basic and advanced Software Quality Assurance learning, a discussion platform, and tools to manage and create test cases, plans, cycles, reports, defects, automation scripts, teams, and overall QA process. These features are realized in a user-friendly mobile and web-based application, TestMeazure. Limitations emerged concerning integration with other platforms. Nevertheless, TestMeazure received positive feedback from QA experts and stakeholders, indicating its potential utility in the field. TestMeazure could revolutionize Software Quality Asuurance practices , field and software development by offering an accessible, free open source, and comprehensive test management tool. In Future Plan to Research and AI and Cloud Technology to TestMezure.

Key words: Test Management Software , Software Quality Assurance , Open-Source Application , SQA Education and Community

AI-Driven Recommendation for Entertainment through emotional identification

R.W.S Piumantha#1, E.A.I Kavinda#2, H.A.D Jayathilaka#3, Dhishan Dhammearatchi#4

(Department of Information and Technology, Faculty of Engineering and Technology, Cinec Maritime Campus)

Abstract - In the modern world, people use Artificial Intelligence (AI) in various ways for various purposes. This research focuses on an AI-based entertainment recommendation system. The core focus of this system is on narrative-driven amusement, specifically in the context of movies, TV series, and anime recommendations. This system includes a chatbot that is engineered to analyze the user's emotional state and change the recommendations accordingly which is accessible through the standard web browser on major devices (such as PC, laptops, and smartphones). And this research examines the advantages of utilizing an AI-driven recommendation system and the limitations when using the current freely available AIs for the system. For this research, secondary fact-gathering methods were majorly used to gather the relevant data. By exploring the current capabilities and challenges of AI technologies in entertainment recommendations, this study aims to provide insights into the identified benefits such as personalized content and improved user satisfaction, and drawbacks that might be associated with this system. Finding narrative entertainment such as movies that will suit their current emotional state can be time-consuming. But this system provides an explicit solution for that problem. The findings will contribute to a comprehensive understanding of the recommendation system, strengths, and limitations of AI-driven recommendation models, and also includes safety and age filters and suggestions for advancements in the field.

Keywords: AI-driven recommendation systems, chatbot, story-based entertainment, movies, TV series, anime, advantages, limitations

Exploring Advanced Machine Learning Techniques for Enhanced Prosthetic Control Using Combined EEG and EMG Signals

B. A. Thivanka Sarathchandra[#1], A.M. Lashika Chamini[#2]

Cinec Campus

< T.S.BellanaArachchige@wlv.ac.uk >

Abstract - In recent times, the evaluation of hand movements through separate analysis of EEG and EMG signals has presented noteworthy limitations. The independent analysis of these signals has often resulted in fragmented insights, indicating the need for a more integrated approach to achieve more robust outcomes. This research dives into an advanced machine learning methodology to augment the control of prosthetic hand movements. By extracting the potential of both Electroencephalogram (EEG) and Electromyography (EMG) data processing, this research aims to enhance the precision of prosthetic movements. This approach places emphasis on developing a multi-modal system that intertwines the fusion of EEG and EMG signals, utilizing machine learning frameworks such as Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs). The methodology initiates with collecting quality EEG and EMG datasets, which undergo preprocessing for noise reduction and amplify data fidelity. This streamlined data is segmented, and undergo through feature extraction forming critical inputs for the machine-learning models during training and validation phases. The evolved machine learning models demonstrate proficiency in real-time predictions, drawing from continuous data assimilation and processing. Subsequent post-processing stages refine the model's outputs, ensuring seamless transitions between accurate predictions. Designed with the aim of continuous learning, the system accommodates periodic model retraining using novel data. Central to this research is a comparison between the efficacy of raw and machine learning processed data, facilitated through a bespoke prosthetic limb simulation. The assessments implicate notable enhancements in both the model's performance and the prosthetic's maneuverability, credited to the integrated preprocessing and the multi-model machine learning strategy. Targeting professionals in biomedical engineering and prosthetics, this research aspires to lay the groundwork for impending innovations by elevating the accuracy of prosthetic movements through the deployment of machine learning paradigms.

Keywords: Prosthetic Limb Control, Electroencephalogram (EEG), Electromyography (EMG), Machine Learning Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Data Preprocessing, Feature Extraction, Real-Time Predictions, Post-Processing, Continuous Learning, Prosthetic Limb Simulation, Maneuverability, Biomedical Engineering, Prosthetics.

Smart Goods Purchasing System using Mobile Application and RFID/NFC Technology for Retail Stores

R.L.D. Rajapaksha[#1], Mr. N.N.Pollwaththage [#2], and Mr. D. Dhammearatchi [#3]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka.[1],

Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka[2],

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[3].

rajapaksharld@gmail.com

Abstract - The retail industry had been grappling with challenges in the traditional purchasing process, including prolonged queues, limited product information, and manual product searches, resulting in suboptimal customer experiences. To address these issues, a solution was proposed that integrated mobile application, web application and Radio Frequency Identification (RFID)/Near Field Communication (NFC) technology, aiming to create a seamless shopping experience for customers. The system served as a gateway for customers, allowing them to access product information, browse catalogs, place orders, and execute secure payments through their smartphones or tablets. With features such as personalized recommendations and real-time stock availability, customers could efficiently discover and purchase desired products, significantly enhancing satisfaction. The project involved comprehensive data collection from Google Forms. The questionnaire was designed for customers, retail store owners and retail store employees. These forms were widely distributed through online channels to ensure a diverse range of participants. By affixing RFID tags or NFC chips to products, customers could access detailed information by scanning the tags and effectuate contactless payments using their mobile devices. This integration streamlined inventory management, enabling retailers to make informed decisions based on data, mitigate instances of stockouts, and optimize their product offerings. Throughout the project, the challenges of implementation were addressed, encompassing costs, compatibility concerns, and staff training considerations. The scope and limitations of the proposed system were also outlined comprehensively. The outcomes of the project held the potential to revolutionize the retail shopping encounter, creating a more intelligent and convenient environment for both customers and retailers. By harnessing the capabilities of mobile applications and RFID/NFC technology, retail stores could elevate their operational standards to cater to the dynamic demands of modern consumers.

Keywords: Smart Goods Purchasing System, Mobile Application, RFID, NFC, Retail Stores, Customer Experience, Inventory Management, Technology Integration.

Automated Portable Weather Station for Botanical Researchers

R.M.I.M. Rathnayaka[#1], Ms. M.V.M. Jayathilake [#2], and Ms. A.M.R. Eshandi [#3]

Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus[1], Sri Lanka Institute of Advance Technological Education[2], Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus[3]

isharamadusanka614@gmail.com[1], mekala@sliate.ac.lk[2], eshandi.amr@cinec.edu[3]

Abstract - This project's objective is to construct and develop an Automated Portable Weather Station (APWS) that will satisfy the requirements of environmental and botanical researchers. The initiative offers a cutting-edge and practical approach to get beyond the challenges of gathering climate data in plant habitats. A few of the critical goals are investigating the methods botanical researchers use to get climatic data, pinpointing the most crucial elements, developing the APWS, testing its prototype, and weighing its benefits and drawbacks. A quantitative approach uses to investigate climatic data-gathering techniques, and surveys, interviews, and literature reviews are often used to collect data on observable indicators. Thirty current professionals specializing in botany and environmental sciences made up the sample. Targets were selected to include them. For effective data collecting and transmission utilizing cutting-edge technologies like IoT and Google Firebase, APWS employs an ESP32 microcontroller and the Arduino IDE. Accurate data collection is possible with frequent recording, several setup choices, and specialized sensors for temperature, humidity, solar radiation, wind speed, and soil moisture. Through the APWS IoT connection, remote access to climate data is possible, and Google Firebase ensures safe cloud data storage. The ESP32 microcontroller, the primary processing unit, controls data collecting and works with the Arduino IDE. Researchers may adapt the APWS architecture's settings to suit their research objectives because of its adaptability and simplicity of usage. The study's findings anticipate impacting policy and practice significantly, providing ongoing, trustworthy, easily accessible climate data and allowing for more investigation and incremental analysis.

Keywords - environmental and botanical researchers, Climate data gathering, IoT, APWS, ESP32 microcontroller

Implementing a Personal Cloud Storage with IOT

Sadhurshan R[#1], Eshandi A.M.R[#2], Jayathilake M.V.M[#3]

The Colombo International Nautical and Engineering College (CINEC)[1], Department of Information Technology[1],

The University of Wolverhampton[2], Sri Lanka Institute of Advanced Technological Education[3].

sadhurshan@yahoo.com[#1], eshandi.amr@cinec.edu[#2], mekala@sliate.ac.lk[#3].

Abstract - The Personal Cloud Storage with IOT is prevalent issue of limited storage capacity on personal devices, exacerbated by proliferation of volume data including high-definition videos and high-resolution photographs. This research seeks to develop an efficient secured cloud storage solution utilizing the Raspberry Pi, a powerful ARM-based microcontroller computer, with focus on data privacy. The research problem centres around the users to manage their data effectively, given the constraints of device storage. The project's objectives aim to address this problem by creating personalized cloud storage system that allows users to offload data onto external storage while ensuring seamless accessibility. Moreover, the research explores the optimization of system performance through virtualization techniques to overcome challenges related to CPU and memory consumption, network throughput, and energy efficiency. The methodology and experimental design adopt a multi-faceted approach. First, the Raspberry Pi is integrated into a cloud storage architecture, employing industry-standard Linux like Debian. Extensive testing is conducted to measure the impact of high-volume data loads on the Raspberry Pi's performance. Additionally, virtualization layers are applied to explore effect on enhancing system performance and responsiveness. The results showcase the efficacy of the Raspberry Pi Personal Cloud Storage system. The outcomes demonstrate successful data offloading and retrieval, with significant improvements in device storage management. This research presents a discussion and practical solution to growing issue of cloud data storage constraints on personal devices. The Raspberry Pi Personal Cloud Storage system offers an efficient means of managing data while maintaining data privacy and security. By utilizing the Raspberry Pi's computing capabilities and implementing virtualization layers, users can now enjoy seamless access to their data, unburdened by storage limitations. This project contributes to the burgeoning field of personal cloud storage solutions, providing a valuable resource for individuals seeking scalable, secure, and user-friendly data management options in the current digital age.

Keywords: Raspberry Pi, cloud storage, personal cloud system, public cloud limitation.

Video Gaming as a Solution to World Problems: Exploring the Potential for Positive Impact

R.P.D.S.M. Jayasena, A.A.P. Laknuwan, R.M.C.L. Rathnayake[#]

Department of Information Technology and Faculty of Engineering and Technology[1], Department of Information Technology and Faculty of Engineering and Technology[2], Department of Information Technology and Faculty of Engineering and Technology[3]

sinthikamalshani01@gmail.com, pubudulaknuwan1234@gmail.com, chandimar.online@gmail.com[#]

Abstract-Video gaming has emerged as a powerful medium with the potential to address world problems and create positive impact across domains such as education, healthcare, social issues, and environmental sustainability. This research aims to explore how video gaming can be effectively utilized as a solution in these domains. By examining various aspects such as education, healthcare, social issues, and environmental sustainability, this study seeks to understand how video games can be leveraged to tackle real-world problems. The research will investigate successful examples of video games designed for social impact, analyze their effectiveness, and identify the underlying mechanisms that contribute to their positive outcomes. Additionally, the study will explore the barriers and limitations associated with using video gaming as a solution, including concerns related to addiction, accessibility, and inclusivity. Furthermore, it will explore the role of video games in healthcare, such as rehabilitation, mental health support, and health education. This expected to identify future directions and areas for further research and innovation in the field of video games for social change. By analyzing relevant literature, examining case studies, and considering the perspectives of experts, hope to provide a comprehensive understanding of how video gaming can be harnessed to create a positive impact on a global scale. By investigating the effectiveness and impact of video gaming across these domains, this research aims to provide insights and recommendations for harnessing the full potential of video gaming as a solution to world problems, ultimately leading to positive change on a global scale.

Keywords: sustainability, mechanisms, innovation, global scale

Smart Energy Meter with Remote Controlled Power Supply and Bill Analyzing

R.V.P.I.U.Kumara[#1], Ms. M.V.M. Jayathilake [#2], and A.M.R.Eshandi[#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Sri Lanka Institute of Advance Technological Education[2], Department of Information Technology, Faculty of Engineering and Technology, CINEC Campus [3]

ishanpathiranage91@gmail.com [#1], mekala@sliate.ac.lk [#2], eshandi.amr@cinec.edu [#3]

Abstract - Energy consumption in homes and companies must be effectively managed due to the rapid increase in energy need. The proposed idea presents an innovative way for addressing this problem: an IoT-based Smart Energy Meter with capabilities for remote control power supply and bill analysis. This project wants to promote energy efficiency, support sustainable living, and give users the ability to monitor and manage their energy consumption in real-time. A Node MCU module works as an intermediate point between the energy measuring unit and the remote web interface in the prototype of a smart energy meter that makes use of modern Internet of Things (IoT) technologies. The energy measurement device, which has been fitted with reliable sensors, estimates electricity consumption properly, and the Node MCU module processes and communicates the data to a user-friendly web interface stored on the cloud platform. Users can get real-time data on their energy use, costs, and power supply status through the interactive web portal from any location, giving them a better understanding of their usage patterns. Users have the ability to take quick action and optimize their energy use to lower electricity bills by being able to identify energy-intensive appliances and unproductive practices. The ability to remotely manage the power supply to the customer's location is an additional unique aspect of the Smart Energy Meter. Power can now be disconnected or connected without the need for on-site visits, which saves time, money, and resources. Remote monitoring and resolution are made feasible in the event of unexpected power interruptions, improving client convenience.

Keywords: Smart Energy Meter, Internet of Things, Power Supply Management, Remote Power Control

Smart Technology for Large-Scale Fish Aquariums

R.G.V.S. Bhagya[#1], N.N Pollwaththage[#2], and D. Dhammearatchi[#3]

Department of Information Technology, Engineering, and Technology, CINEC Campus[1], Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka[2], Department of Information Technology, Engineering, and Technology, CINEC Campus[3]

vishmabhagya93@gmail.com[1], npollwaththage@gmail.com[2], Dhishan.dhammearatchi@cinec.edu[3]

Abstract - Large-scale fish aquarium management presents difficulties for Sri Lanka's aquaculture sector, particularly when it comes to the farming of discus fish (Symphysodon spp.). These systems' manual water parameter monitoring is time-consuming and frequently results in less-than-ideal conditions for the fish, impeding their growth and well-being. This study suggests integrating smart technology to optimize discus fish farming in Sri Lanka, specifically by using pH sensor, temperature sensor, and water level sensor. The objective of this project is to design a smart technology system that allows for real-time monitoring and data collecting of pH, temperature, and water levels in a large-scale discus fish aquarium. The project also seeks to build an application to monitor water quality, assuring the ideal circumstances for discus fish growth. Through this, the effects of using smart technology on overall aquariums performance will be thoroughly assessed, with results compared to those obtained using traditional manual management techniques. A prototype methodology has been implemented in this large-scale discus aquarium facility in Sri Lanka, combining smart technology with three different types of sensors—pH, temperature, and water level sensors. Observing fish habits, health, and growth in different environmental settings constitutes the qualitative component. To provide real-time data for analysis, the quantitative component continuously monitors and records pH levels, water temperature, and water levels. This integrated qualitative and quantitative technique ensures thorough comprehension of the health of the fish and permits exact changes to establish the best conditions for the discus fish's healthy growth and reproduction in the aquariums. Results from the large-scale aquarium project in Sri Lanka that included pH, temperature, and water level sensors for discus fish are statistically significant. The data analysis showed that, when keeping pH values between 6.0 and 7.0, there is an important relationship between pH levels and fish behavior. A 95% confidence interval was used in the study to determine the ideal temperature range of 25–30°C for discus fish growth and reproduction. The system's reliability was confirmed by the fact that changes in water level of less than ±2 cm had no adverse impacts on fish health. These results show how smart technology is effective in preserving ideal conditions for discus fish in large-scale aquariums. The research reveals that smart technology, using pH, temperature, and water level sensors, is a promising strategy for improving large-scale discus fish farming in Sri Lanka. The accuracy with which the automated system monitors water parameters have a good impact on fish health and growth, encouraging effective and sustainable aquaria management techniques. The study's findings offer useful data for the aquaculture sector, opening the door for a wider usage of smart technologies to advance fish farming methods globally.

Key Words - Large-Scale Fish Aquarium, Smart Technology, Fish Health, Water Quality

Using Mobile Phone as the Third Eye for Blind People

S.D.O. Fernando, Mr. N.N. Pollwaththage#1, and Mr. D. Dhammearatchi#2
Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd,
Millennium Drive, IT park, Malabe, Sri Lanka. 1,
Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka 2,
Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd,
Millennium Drive, IT park, Malabe, Sri Lanka3.
oshakafernando@gmail.com, npollwaththage@gmail.com#1,
Dhishan.Dhammearatchi@cinec.edu#2

Abstract - Visual impairment causes significant problems for everyone around the world, making it difficult for blind people to navigate, recognize objects, and access information. The research problem is to overcome these difficulties by creating a mobile application that serves as a "third eye" and makes use of the camera on a user's phone coupled with AI-based Algorithms. The objectives of this study are to recognize objects, text, and people while offering real-time audio advice and descriptions to empower users to navigate their surroundings with more assurance and independence. The methodology includes developing an innovative app that transforms how blind individuals interact with their surroundings and get crucial information. Designing a user-friendly Android application using the Flutter framework that can recognize and describe the environment around it, improving the phone's camera for high-quality image capture, and creating an effective communication protocol for real-time data transmission to the user's earphones. The performance of the application was thoroughly tested and assessed, with a focus on actively soliciting feedback from people who are blind. Through the creation of an accessible and user-friendly tool, a creative endeavor was launched to improve the freedom, mobility, and general quality of life for those who are blind or visually impaired. This project fulfilled a dream of enabling visually impaired people to confidently navigate their environment and actively participate in many parts of daily life. By giving blind users real-time audio descriptions of their surroundings, the accessibility gap was closed and a more inclusive and empowered for persons with visual impairments was created. Through this mobile application, it is intended that technology will be used to significantly and practically enhance the lives of millions of individuals, working to create a society that is more tolerant of and supportive of those who have visual impairments.

Keywords: Android Application, AI-based Algorithms, Visual impairment

Blood Bank Management System using IoT

S.Nasman [#1],D.Dhammearatchi [#2], and N.N.Pollwaththage [#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Sri lanka Institute of Advance Technological Education[2], Department of Information Technology, engineering and technology, CINEC Campus [3]

nasmanhntr@gmail.com [1], dhishan.dhammearatchi@cinec.edu [2], npollwaththage@gmail.com [3]

Abstract - An innovative project called the Blood Bank Management System using IoT aims to transform the field of managing blood inventories. In order to successfully track and manage their blood supply, blood banks encounter significant obstacles, which are the focus of this project. Currently, manual inventory procedures are prone to mistakes, delays, and waste, which emphasize the need for an original solution. In order to precisely track blood inventory and guarantee its best availability, the project presents a sophisticated framework that makes use of Internet of Things (IoT) technology. The system provides real-time insights into blood stock levels and temperature conditions by utilizing weight sensors and temperature sensors in blood storage units. RFID readers are used in conjunction with these sensor inputs to precisely control inventories by determining the age of blood packets, also the machine learning algorithms are integrated to forecast blood need based on historical data patterns, significantly increasing accuracy. The brain of the system is a user-friendly online interface that provides real-time information and enables authorized workers to easily manage the blood bank's inventory and quickly react to emergency circumstances. The project's results are expected to have a significant influence on blood inventory management, reducing waste and assuring prompt access to blood units. The successful use of IoT in the Blood Bank Management System highlights the technology's potential in healthcare settings and emphasizes its contribution to improving operational effectiveness and patient care. This innovative project not only resolves the urgent issues blood banks are currently facing, but it also establishes a standard for the use of IoT and smart technology in healthcare systems as a whole.

Keywords- Management, sensors, RFID

Safeguarding Vertical Transportation: Exploring the Role of Smart Screen Elevator Systems in Panic Situations for Enhanced User Safety and Efficient Emergency Response

W.D.C. Kaushalya[#1] (IT Department, Faculty of Engineering and Technology, CINEC),
W.A.C. Fernando[#2], G.K. Ganegama[#3], Dhishan Dhammearatchi[#]
chaminikaushalya11@gmail.com
sandyafernando888@gmail.com
kaveendhya001@gmail.com
<Dhishan.Dhammearatchi@cinec.edu>

Abstract- Nowadays most people have busy lives and there is a tendency to use smart technology with the development of technology, people want to have a smart life. Most electronic devices help to advance their lives through technology. The elevator is a most useful technological method to make transport easier among floors of buildings. Although when the elevator gets stuck, there will be a loss of network inside the elevator. The panic situation in elevators can lead to confusion and heightened anxiety among the users is one of the major problems that has arisen. This research aims to reduce the panic situation in elevators using a smart screen elevator system included with smart screen, speakers, microphone, and air freshener. The research utilizes a case study approach focusing on some elevator users and collecting their feedback and suggestions about an emergency situation in an elevator. This study analyses the results and the suggestions demonstrate several ways to implement the smart elevator system. Clear instructions and safety procedures are displayed on the screen and guide users effectively to reduce confusion and panic. The AI bot enables the system to respond appropriately to different emergency situations, rerunning elevators and providing relevant information to the users. And also, the emergency communication system is included by speakers, a microphone, and a camera. It also helps to facilitate an efficient combination between occupants and the rescue team. These findings suggest that the smart screen elevator system offers solutions to reduce panic situations in elevators. By providing information and communicating with users, the system enhances users' safety and releases stress levels during emergencies. Further research is needed to explore the mechanisms to improve this smart screen elevator system that enhance the mental health of elevator occupants.

Keywords: elevator, smart screen, panic situation, speakers, microphone, AI bot

Smart Irrigation System With IOT

T.L.Manamperi [#1], B.Fernando [#2], and D.Dhammearatchi [#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Sri lanka Institute of Advance Technological Education[2], Department of Information Technology, engineering and technology, CINEC Campus [3]

thakshikamanamperi94@gmail.com [1] , bhanuka@gmail.com [2] Dhishan.Dhammearatchi@cinec.edu[3]

Abstract- In the abstract, the Smart Irrigation System with IoT is introduced, together with its methodology, architectural design, sensors, and components, as well as major discoveries. The functional requirements of this project are the Sensor Integration,Data Collection and Processing ,Remote Access and Control,Automated Irrigation Control,Water Conservation,Alerts and Notifications,Energy Efficiency,Scalability and Flexibility,Integration with Existing Systems, User Insights and Analytics,User Authentication and Security and Maintenance and Diagnostics .Through the application of IoT technology for higher crop yields, water conservation, and optimum irrigation, this project seeks to disrupt traditional agricultural methods.The methodology combined IoT, agricultural engineering, and data analytics in a multifaceted manner.An architectural design that enables real-time monitoring and remote control of irrigation activities is made up of a network of strategically placed sensors and actuators. This abstract report illustrates my project's unique proposition, which focuses on quickly notifying farmers during important scenarios to provide them with critical data about their crop productivity. Important sensors collect information on the state of the soil and the forecasted weather, which is then processed and analyzed by an IoT-enabled cloud platform to help farmers decide when and how much to irrigate their crops. The use of real-time weather data integration into a smart irrigation system controlled by IoT technology defines this project. The technology autonomously modifies irrigation schedules and volumes to fit with prevailing weather conditions by combining current meteorological information from local sensors and online sources, assuring optimal water utilization and crop health. The use of the Smart Irrigation System produced important results, demonstrating a remarkable reduction in water usage by up to 30% when compared to traditional irrigation techniques, resulting in water conservation and cost savings. Additionally, better crop yields brought about by the system's adjusted irrigation schedules encouraged sustainable agriculture and guaranteed food security. The system's real-time monitoring capabilities made it possible to quickly identify irrigation system problems, allowing for immediate maintenance and averting potential crop loss. For a more secure and fruitful future in agriculture, the Smart Irrigation System with IoT offers a practical and innovative method for modernizing agricultural methods, solving water scarcity, and fostering sustainable resource management. This study offers insightful information about the possibilities of IoT-based agricultural solutions, opening the door for the widespread adoption of cutting-edge farming technologies.

Keywords- Smart Irrigation System, IoT, Water efficiency, Crop productivity.

Privacy and Security Concerns in Interconnected Healthcare Systems: Implementing Robust Cybersecurity Measures to Protect Patient Privacy

T.C.N. Weerasooriya, G.V.L. Sampath D.H.G.I.S. Jayathissa and J.I.S. Jayaweera[#]

Department of Information Technology and Faculty of Engineering and Technology [1], Department of Information Technology and Faculty of Engineering and Technology [2], Department of Information Technology and Faculty of Engineering and Technology [3], Department of Information Technology and Faculty of Engineering and Technology [4]

chethaniweerasooriya09@gmail.com, gvls7788@gmail.com, isurikasj@gmail.com, sewminijayaweera15@gmail.com

Abstract- As interconnected healthcare systems continue to evolve and technology is increasingly integrated into healthcare systems, there are increasing concerns about the privacy and security of patient data. This research paper aims to investigate privacy and security issues related to the storage and sharing of sensitive patient data in interconnected healthcare service systems and proposes strategies to implement robust cybersecurity measures to protect their privacy. A primary privacy concern in interconnected healthcare systems is unauthorized access to patient data. Malicious actors, including users and insider threats, have vulnerabilities in system infrastructure, weak authentication mechanisms, and practice data prevention measures to gain access to patient records. Healthcare organizations must implement robust cybersecurity measures to meet these challenges. Research begins by examining the interconnected nature of healthcare systems and their benefits, such as improved patient care and improved data sharing. There are several steps involved in this, including adopting encryption techniques, implementing secure authentication and access, updating and patching systems, conducting detailed vulnerability findings, and incident response planning. Additionally, staff training and awareness programs should be implemented to educate them on the importance of using cybersecurity and protecting patient privacy. The research highlights the need for collaboration between healthcare organizations, regulatory agencies, and cyber-host organizations to establish industry-wide standards and guidelines to secure the interconnected healthcare system. These standards should address privacy protection, data exchange protocols, secure communication channels, and risk management practices. This paper will be focused on Safeguarding patient privacy in interconnected healthcare systems, which is paramount. Through this paper, the solution to the above-mentioned problems will be found by Implementing robust cybersecurity measures, promoting awareness and collaboration, and enforcing regulations that are vital for protecting sensitive patient information. By doing so, healthcare organizations can ensure the confidentiality and trustworthiness of their digital infrastructure, providing secure healthcare services to patients.

Keywords – Security, Healthcare, Privacy, Cybersecurity

Leveraging Digital Twin Concepts in the Apparel Industry: Strategies for Cost Reduction and Operational Efficiency

Thepuli Kavindhya, Asheni Tamasha, Dhishan Dhammearatchi

Department of IT, Faculty of Engineering and Technology, CINEC Campus Malabe.

thepulikavindhya@gmail.com, asheitamasha@gmail.com, Dhishan.Dhammearatchi@cinec.edu

Abstract- This research paper explores the application of the digital twin (DT) concept in the apparel industry and proposes strategies to reduce the associated costs. The digital twin concept, which involves creating a virtual replica of a physical product or process, has gained significant attention in various industries due to its potential to improve operational efficiency and decision-making. In the apparel industry, digital twins can be utilized to simulate and optimize various stages of the product life cycle, including design, manufacturing, and supply chain management. To implement digital twins effectively and reduce costs, several key considerations must be addressed. The high cost is the major issue with this concept. As a result, using and maintaining the concept is more difficult than thinking. The scope of this research paper is to create dresses and manage costs according to customer preferences by using the DT concept. This research paper presents strategies to minimize the costs associated with digital twin implementation in the apparel industry, such as data integration, simulation and analysis, predictive analytics, quality control, and real-time monitoring. By collecting real-time data from the physical product and feeding it back into the digital twin model, companies can identify optimization opportunities and drive cost-reduction initiatives. This iterative process allows for ongoing refinement and enhancement of the digital twin, leading to improved efficiency and cost savings over time. Implementing the digital twin concept in the apparel industry offers significant potential for enhancing operational efficiency and reducing costs. It helps to provide customized products. By focusing on accurate data collection, advanced modeling techniques, cost-effective implementation strategies, and continuous improvement, apparel companies can harness the benefits of digital twins while minimizing associated expenses.

Optimizing Paddy Fields with IOT Rainwater Monitoring System

U.M.Sampath[#1,] N.N.Pollwaththage[#2,] D.Dhammearatchi[#3]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka. 1,

Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka 2,

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka 3.

Maduranga1993@gmail.com

Abstract- The research problem addressed in this study was the need to optimize water management in paddy fields to enhance crop yield and productivity. To achieve this, an IoT-based rainwater monitoring system was developed and implemented. The study aimed to assess the effectiveness of this system, identify key influencing factors, evaluate its impact on crop yield and water usage, and determine its economic feasibility compared to traditional irrigation methods. In pursuit of the objectives, a comprehensive experimental design was employed. IoT sensors were strategically placed in the paddy fields to measure rainfall. The collected data were wirelessly transmitted to a web-based system. Real-time monitoring and visualization of the data were made accessible to farmers through a user-friendly web interface. The system also provided timely alerts and crop management recommendations based on predictive analytics derived from the data. The results and discussion showcased the system's effectiveness in optimizing water management, improving crop yields, reducing water consumption, and minimizing labor costs. The study revealed significant positive correlations between the rainwater monitoring system and crop productivity. Furthermore, it highlighted key factors influencing the system's performance and demonstrated its superiority over conventional irrigation methods in terms of cost and efficiency. In conclusion, the IoT rainwater monitoring system proved to be a viable and sustainable solution for enhancing paddy field management. The system's real-time data and predictive insights empowered farmers to make informed decisions, leading to increased productivity and resource conservation. By optimizing water usage and crop management, this technology contributes to sustainable agriculture practices and food security in the region. The successful implementation of the system paves the way for its widespread adoption in other agricultural contexts to further drive positive environmental and economic impacts.

Key Words: Rainwater Monitoring System, web-based system, wireless, real-time data

Location Tracking and Smart Payment Method for Expressway Buses in Sri Lanka

U.G.R.M. Jayarathna[#1], Dharshana Hettiarachchi[#2], and Bhanuka Fernando[#3]

CINEC Campus [3]

ravindujayarathna01@gmail.com [1]

Abstract- The integration of location tracking and a smart payment method using for Sri Lankan expressway buses shows a big advancing approach to modernizing public transportation systems. In this project, writer hopes to cutting-edge technology is harnessed to enhance passenger convenience, optimize fleet management, and improve overall operational very efficiency. In this system's core function is real-time location tracking, achieved through the implementation of Global Positioning System (GPS) technology on each expressway bus. Passengers can gain access to live updates of the bus's location through a mobile application. Using this real-time tracking empowers travelers can plan their journeys more effectively, minimizing waiting times and enabling them to make informed decisions about their travel routes. The key innovation in this project is the author's introduction of a smart payment method, removing the traditional method of cash transactions. This mobile application facilitates seamless and secure ticket purchases using multiple payment options, such as credit/debit cards, mobile wallets, or contactless payment methods. The system's automated fare calculation ensures accurate and fair charges based on the distance traveled, deducting the appropriate fare from the passenger's chosen payment method. Also, this not only reorganizes the ticketing process but also mitigates fare evasion and improves revenue collection for bus operators. Collected busses GPS data can analyzed to identify patterns in passenger demand and optimize bus schedules accordingly. Using Such as optimization leads to reduced operational costs, better resource allocation, and a higher standard of service delivery, benefiting both passengers and transportation providers. Moreover, this mobile application gives integration of real-time alerts and notifications keeps passengers updated on bus arrivals, delays, and any schedule changes, minimizing travel uncertainties and disruptions. Giving the Safety and security are enhanced as the tracking system enables swift responses to emergencies or breakdowns.

Keywords- GPS, smart payment method, real time location tracking, live updates

Development of a Game Using Voice Command and Facial Expressions Recognition for Autism Children

V.M. Withanage[1], D. Dhammearatchi[2] and N N Pollwaththage[3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Department of Information Technology, Engineering and Technology, CINEC Campus[2], Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka[3]

Viraj0301@gmail.com1 , dhishan.dhammearatchi@cinec.edu [2], npollwaththage@gmail.com[3]

Abstract – This project report presents a game designed to help children with autism improve their communication and sensory skills. The project focuses on using voice commands and facial recognition technology to create interactive and engaging experiences for children with autism. The report focuses on the goals, strategies, implementation details, results and future recommendations for the project. The project began with research on Autism Spectrum Disorder and the challenges faced by children with autism in communication and emotional intelligence. A comprehensive literature review examines the role of technology in the treatment of autism and the potential benefits of voice and face recognition technology. The Help section describes the game's design and concept, including attribute, character selection, and game mechanics. It details the voice command technology and facial recognition technology that will be included in the game, and also discusses the architecture, API, and operating system. The implementation phase includes the development of the structure of the game and the specific steps for implementing voice commands and facial expression recognition. Testing and debugging systems are described, including the results of user testing sessions, performance evaluations, and data analysis. The discussion section evaluates the achievement of project goals, reports on limitations and challenges encountered during development, and compares the developed game with existing solutions. The conclusion summarizes the main findings, highlights contributions to the field and offers future recommendations for further game development. This project report is a comprehensive guide to developing games that use voice commands and facial recognition for children with autism. It provides insight into the effectiveness and effects of gaming on communication skills and emotion recognition and provides valuable directions for future research and development in this field.

Keywords: Voice Command / Facial Expressions / Autism Children / Game

Emergency alert system for no-service areas for campsite visitors using LoRa + Mesh technology.

W.A.D.S.B. Aldeniya[#1], N.N. Pollwaththage[#2], and D. Dhammearatchi[#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka[2], Department of Information Technology, Engineering and Technology, CINEC Campus[3]

dineshansrialdeniya@gmail.com [1] , npollwaththage@gmail.com [2], dhishan.dhammearatchi@cinec.edu [3]

Abstract – This study explores the enjoyment derived from camping and outdoor activities, juxtaposed with the inherent risks they entail during emergencies, particularly in rural areas where cellular and internet connectivity is often deficient. To address this, an Emergency Alert System leveraging LoRa + Mesh Technology is proposed, utilizing the synergistic capabilities of Mesh networks and LoRa technologies for reliable remote communication. The system can utilize LoRa mesh-enabled end-devices or portable artifacts to bridge communication gaps. Managed by the campsite, a prototype device is introduced to swiftly receive and relay emergency alerts. The adoption of a cloud-based Blynk IoT application streamlines the management of end-devices and emergency contacts, facilitating processes like device registration and emergency instructions. Titled "Emergency Alert System to No-Service Areas for Campsite Visitors Using LoRa + Mesh Technology," the project aims to provide an efficient emergency alert system for rural campers. Through LoRa + Mesh technology, it informs visitors about adverse weather, disasters, and medical emergencies, prioritizing reliable communication. The integrated prototype device promptly alerts authorities, while the Blynk IoT Platform ensures effective management. This endeavor aims to enhance camper safety and mitigate emergencies, addressing challenges of limited network access. The research results in a robust system, utilizing LoRa + Mesh technology for wireless communication. Thorough testing validates its reliability, user-friendliness, and effectiveness for campers and responders. Future enhancements could involve additional sensors for more comprehensive emergency responses, refining the system through real-world trials.

Keywords- *LoRa, Mesh, IOT*

Eliminating Manual Human Work Via Robotic Automation Process.

Kushani Bandara[#1], Darshana Tithira[#2]

Faculty of Science and Engineering, Department of IT

darti02@gmail.com

Abstract - This article addresses the research of Eliminating Manual Human Work via Robotic Automation Process, which often lacks scalability, human errors,Time consuming, high labour cost. This study aims to streamline repetitive and labour intensive tasks through the integration of advanced robotics, sensors, and artificial intelligence algorithms. The research was conducted to implement Agile methodology, the application of automated testing tools and frameworks in an agile software development process to support testing activities. The Design and implementation of robotic systems that may carry out operations typically handled by operators in person. Robotic arms, machine vision systems, and adaptive learning algorithms are important components that allow automation to adapt to changing situations and improve performance. The research reveals the significant reduction in manual human labour, that improves operational effectiveness and lowers mistake rates. The automated system outperforms manual methods in terms of both speed and accuracy, displaying exceptional precision and consistency. Overall conclusion of this research paper illustrates the revolutionary potential of robotic automation in eliminating all forms of manual human labour. Organisations may increase productivity, streamline processes, and improve workplace safety by utilising cutting-edge technologies. Strategic planning, technological know-how, and a cooperative attitude between people and machines are necessary for successful implementation.

Keywords. - Robotic Automation, Labour intensive, artificial intelligence Algorithm, Robotics, Robotic arms, Machine vision.

Gasoline Volume Indicating System

W.T.Ranjan[#1], A.M.R.Eshandi[#2], and M.V.M.Jayathilaka[#3]

Department of Information Technology, Engineering and Technology, CINEC Campus1, Sri Lanka Institute of Advance Technological Education2, Department of Information Technology, engineering, and technology, CINEC Campus 3

thusitha.delta@gmail.com[#1] , eshandi.amr@cinec.edu[#2], mekala@sliate.ac.lk[#3]

Abstract - In Sri Lanka, fuel is an essential commodity for the public, and its value has been particularly significant during the recent economic crisis. This study presents an endeavor aimed at developing an innovative instrument called the 'Gasoline Volume Indicating System.' The primary goal of this instrument is to accurately measure the amount of fuel refilled in any vehicle. Frequent cases of injustice have been reported at fuel refilling stations, where station personnel engage in various fraudulent practices to increase their earnings. One common method involves tampering with the fuel refilling machine to dispense less fuel than that for which the customer has paid. The proposed system comprises two main units. Unit one consists of a flow rate sensor, a Micro Controller board, an LCD display, and a Bluetooth module. This unit can be either fixed or removable, depending on the affordability and compatibility with the vehicle's fuel tank inlet. The second unit is a Smart phone running on an Android-based operating system, utilizing the ArduTooth application to display incoming data from the Bluetooth module. The flow rate sensor measures the fuel flow, and after performing calculations based on uploaded code, relevant data is transmitted to the Bluetooth module, which then sends the data to the Smart phone. This provides the only visible way of accessing the data. The Android application, in addition to displaying the data, offers features such as fuel volume testing, fuel cost calculation, fuel economy calculations, and generating monthly reports. This enables customers to obtain an accurate estimate of the volume of fuel they refill and the corresponding expenses. By implementing this system, fuel refill-related tricks and frauds worldwide can be significantly reduced. This system is designed to be cost effective and easily adaptable to various vehicles, requiring minimal modifications for implementation.

Keywords: Fraudulent practices, Gasoline volume, Flow rate sensor

RFID Based Digital Fine Management System for Garment Factories

W.G.H.G.P. Weliketiya[#1], Miss. A.M.R.E. Aththanayake[#2], and Ms. M.V.M. Jayathilake[#3]

CINEC Campus[1], SLIIT Campus[2], Sri Lanka Institute of Advanced Technological Education[3]

welihgp@gmail.com, eshandi.amr@cinec.edu, mekala@sliate.ac.lk

Abstract- The "RFID-Based Digital Fine Management System for Garment Factories" is an innovative project aimed at enhancing efficiency and streamlining fine management processes in garment manufacturing facilities. In today's fast-paced industrial environment, managing employee compliance with safety regulations and maintaining discipline is a critical aspect of ensuring a safe and productive workplace. The main objective of the project is to replace traditional manual methods of monitoring and recording employee violations with an automated and accurate system. The RFID-based solution will involve equipping employees' identification cards or wearable tags with unique RFID chips, which will be integrated with the factory's centralized database. The proposed system will work as follows: When an employee commits an infraction, such as violating safety protocols, dress code, or workplace rules, the RFID reader strategically placed across the factory premises will capture the event. The system will then automatically record the details of the violation, including the employee's identification, date, time, and the nature of the offense. Subsequently, the factory management will be notified, and the fine will be imposed accordingly. This system will significantly reduce manual paperwork, minimizing the chances of errors and inconsistencies in the fine recording process. In conclusion, the "RFID-Based Digital Fine Management System for Garment Factories" seeks to revolutionize fine management practices, enhancing productivity, safety, and discipline within the workplace. By leveraging RFID technology, this project aims to create a model for garment factories and industrial settings to adopt a more efficient, automated, and accurate approach to managing fines and promoting a culture of compliance and responsibility.

Keywords - RFID Technology, Digital Fine Management System, Garment Factories

Smart Farming Application using Machine Learning and IoT Sensors to Increase Yield for Home Grown Vegetables

S.N.Yuwan Kavindu[#1], Mr. N. N. Pollwaththage[#2], and Mr. D. Dhammearatchi[#3]

CINEC Campus[1], Sri lanka Institute of Advance Technological Education[2], CINEC Campus [3]

Kavindunoiz22@gmail,com

Abstract - In recent years, agriculture has transformed due to smart farming technologies. The project aims to develop an advanced smart farming system using IoT sensors and machine learning to boost vegetable yields. The system employs IoT sensors to measure key environmental factors like temperature, humidity, and soil moisture, providing real-time data for insights into plant growth conditions. Machine learning algorithms analyze this data, identifying patterns between environmental factors and yielding optimal results. Using this data-driven approach, yields can be determined for the given environmental conditions. A key component of the project is the development of a user-friendly mobile application that will serve as the control center for the smart farming system. Through this application, users can remotely monitor environmental conditions, control system settings and receive timely notifications of any significant changes or issues. The research problem is the need to develop an innovative mobile application for farmers to get the maximum yield for homegrown vegetables. Objectives involve designing a smart farming system with IoT sensors and machine learning, collecting and analyzing IoT data to predict the best environmental conditions for high yield, and creating a real-time mobile app. Expected outcomes include significant crop yield improvement and resource management enhancement. The project introduces an innovative approach to vegetable farming through IoT technology, machine learning, and real-time monitoring, potentially revolutionizing traditional practices for a more sustainable agricultural future. The methodology includes data collection via a Google Form questionnaire and observation for feasibility assessment. The smart farming app informs users about optimal IoT sensor values to achieve maximum yield, facilitating the highest possible crop production for farmers.

Keywords- Machine Learning, IOT Sensors, Vegetable Yields

Smart Pet Collar and Leash for Senior Citizens

H.M.A.G.C.N. Karalliyadda[#1], Miss. A.M.R.E. Aththanayake[#2], and Ms. M.V.M. Jayathilake[#3]

Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[1], Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lank[2], Department of Information Technology, Faculty of Engineering, CINEC Campus (Pvt) Ltd, Millennium Drive, IT park, Malabe, Sri Lanka[3].

navanjanakarlliyadda@gmail.com[1], eshandi.amr@cinec.edu[2], mekala@sliate.ac.lk[3]

Abstract-The majority of elderly pet owners love to walk with their pets but lack specialized tracking them. The duties of pet ownership become more challenging as they age and their physical and mobility abilities deteriorate. By fusing technology with pet care, the "Smart Pet Collar and Leash for Senior Citizens" project ensures safety, companionship, convenience of ageing world population. The main objective of this project is to enable seniors to more effectively manage the well-being of their pets while nurturing their well-being. The methodology has an approach with several steps. The GPS tracking, touch sensors, and body temperature monitoring features of the smart pet collar and leash allowed for real-time tracking of the whereabouts and wellness of the pets and elders. Apart from the hardware device the system stored all details about the pet in the database of the user-friendly mobile application. Seniors and caregivers may easily interact with the collar & leash and have control over its features thanks to the app with customizable settings for tracking options, feeding reminders, vaccination schedules, and health records. Discussion focuses on the advantages of combining technology with pet companionship for senior persons' mental and physical health. The results highlight the smart pet collar and leash's potential to improve elderly people's quality of life, encouraging the implementation of comparable technology in assisted living facilities. In the conclusion, the 'Smart Pet Collar and Leash for Senior Citizens' project effectively addressed the project's goal by coming up with a creative way to improve senior people's well-being through the company of pets while maintaining their safety. Project's multifaceted strategy demonstrated the value of fusing knowledge from many domains to produce useful technology for an ageing population.

Keywords: senior citizens, safety, well-being, smart pet collar and leash

Health Band with e-channeling (Special for Lung patients)

M.G.P.Madhuranga[#1], D.Dhammearachchi[#2], and N.N.Polwattage[#3]

Department of Information Technology, Engineering and Technology, CINEC Campus[1], Department of Information Technology, Engineering, and Technology CINEC Campus[3], Sri Lanka Telecom PLC, Lotus Road, Colombo 01, Sri Lanka[2]

madhurangapramod@gmail.com [1] ,   Dhishan.Dhammearatchi@cinec.edu[2] , npollwaththage@gmail.com[3]

Abstract - This project combines advanced technology with healthcare knowledge to bring about a significant advancement in patient-focused care. Combining a health band with a smart application addresses the specific challenges faced by those dealing with lung problems. The health band is capable of tracking key health indicators like heart rate, temperature, and oxygen levels, and it includes sensors dedicated to monitoring lung function, giving valuable insights into respiratory health. The core of the project's impact is the smart application, which simplifies the healthcare process for lung patients. The convenience of scheduling appointments online removes the need for traditional in-person visits or phone calls. This digital platform empowers patients to manage their health and enables healthcare providers to take proactive measures. With the ability to monitor patients remotely using real-time health data collected by the health band, doctors can detect potential issues early and intervene promptly, particularly for those with chronic lung conditions. Data security is of utmost importance in healthcare innovations, and the application ensures the protection of private patient information through robust security measures. Adherence to healthcare regulations demonstrates ethical and responsible implementation. The success of this initiative is rooted in its user-friendly approach. The simple design of the health band and the intuitive application interface make the solution accessible to users with varying levels of technological familiarity. Rigorous testing and validation processes underscore its reliability and accuracy. As healthcare continues to embrace digital transformation, this project represents a promising advancement. By empowering patients to manage their health and facilitating strong connections between patients and healthcare providers, it paves the way for a future defined by personalized, efficient, and patient-centered healthcare solutions. This innovative blend of technology and healthcare expertise promises an improved quality of life for lung patients and sets the stage for exciting possibilities at the crossroads of healthcare and innovation.

Keywords- *Health band,* Sensors*, Lung patient*

Smart Garbage Monitoring System For E-waste Management Using IoT

Buddhini Samarakkody[#1], Maduwanthi Uthpala[#2], W.M.H.Navishka Peiris

Department of Software Engineering, Faculty of Engineering and Technology, Cinec Campus (Pvt)Ltd, Millenium Drive, IT park, Malabe, Sri Lanka,

buddhinisam@hotmail.com[#1],maduwanthi.uthpala@cinec.edu[#2],<navishkapeiris@gmail.com>

Abstract - Waste management is a major issue in developed and developing countries, with public areas overflowing before cleaning procedures. Garbage identification, tracking, and management are crucial concerns for society today. Traditional methods, such as physically tracking waste in trash cans, are time-consuming and incompatible with modern technologies, causing diseases and hazardous gas inhalation. Growing population demands efficient garbage and e-waste management, with IoT technology enabling faster and cleaner solutions for responsible authorities. This study is based on south ulhitiyawa region, Wennapuwa. The information for the research was collected through surveys and secondary data. The target population was the general public in and the municipal council staff. The sample size includes 15 from each group. According to this respondent rate is 98%. The data analysis takes a quantitative facet and the result of this analysis is the traditional way of collecting waste has many issues and needs improvements. Designing the mobile application prototype awoke the interest in the participants to experience this method of waste collection. Only municipal officers are allowed to access this mobile application. This work is mounted on a smart waste system in order to manage e-waste and other environmental waste to prevent all such dangerous situations and to maintain public cleanliness and health. In this study, a smart alert system for garbage clearance is proposed. It works by sending an alert signal to the municipality through an SMS to request immediate dustbin cleaning with appropriate verification based on waste fill level. The system displays the status of various five categories of garbage: polythene, paper, glass, plastic, and e-garbage. The primary goal of the effort is to create a smart garbage monitoring system for e-waste management using IoT. Conducting research, making recommendations, and designing a prototype for a mobile application are objectives to reach the goal of this project.

Keywords: e-waste management, garbage, monitoring system

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Factors Influence on Selecting Hotels by Domestic LGBT+ Tourists in Sri Lanka

Minolee P.L.G[#1], Madhusankha W.A.I[#2], and Abhayawickrama K.L.H.M[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC campus, Malabe, Sri Lanka

<minolee1997@gmail.com>

Abstract – This study aimed to ascertain the factors that influence consumer purchase decisions within the LGBT+ tourist community in Sri Lanka. LGBT+ tourism is a growing trend globally, but it poses social and cultural challenges in Sri Lanka due to its deviation from local norms. The objective of this study was to understand the needs of LGBT+ tourists and provide high-quality services to cater to those needs, thereby boosting the tourism industry. The study focused on five independent variables, namely functional value, emotional value, customer reviews, image, and subjective norms, along with their sub-variables. A survey questionnaire consisting of 39 questions was distributed among LGBT+ tourists residing in Sri Lanka, and 93 respondents participated. Primary data was collected through the questionnaire, while secondary data sources were utilized to develop the conceptual framework. The researcher employed a snowball sampling technique and analyzed the collected survey data using SPSS software. The research investigated the impact of functional value, emotional value, customer reviews, image, and subjective standards on customer purchase decisions when selecting a hotel. The findings revealed that LGBT+ tourists prioritize these factors when choosing a hotel, which can be leveraged to create a welcoming environment for local LGBT+ tourists and stimulate business growth. This research has the potential to generate profits and foster business expansion. Hoteliers can offer reliable, convenient, and high-quality services, although limited research exists on this topic due to the prevailing sociocultural norms. However, as this emerging trend gains wider acceptance, future researchers can explore topics such as creating LGBT+-friendly destinations, establishing Sri Lanka as an LGBT+ tourism hotspot, and examining the conflict between the legal framework and the concept of LGBT+ tourism.

Keywords: functional value, emotional value, customer reviews, image, and subjective norms

Analyzing the Ways of Promoting Yacht Tourism in Colombo City: with Special Reference to Standard Type Yachts and Luxurious Yachts.

Anuruddha M.P.N[#1], Siriwardena S[#2], and Abhayawickrama K.L.H.M[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<anuruddhanadeeshan20@gmail.com>

Abstract – Yacht tourism has gained significant attention as a potential driver of economic growth and tourism development in the Colombo district. This research aims to identify the factors that impact yacht tourism promotion in the Colombo district. A quantitative method was adopted, utilizing a questionnaire survey to collect relevant data. The study focused on three predictable variables: technical support, facilities, and government support with yacht tourism promotion considered the dependent variable. Data was collected from a sample of one hundred eighty individuals residing in the Colombo district. The collected data was analyzed using charts, diagrams, and descriptive statistical tables to summarize the findings. The reliability of the indicators was assessed using Cronbach's alpha, with all variables showing values greater than 0.7, indicating high reliability, the inferential analysis utilized Pearson correlation to examine the relationships between the dependent and predictable variables, while regression analysis was employed to develop a model. The correlation analysis revealed a strong positive and significant relationship between all the selected factors and yacht tourism promotion. Regression analysis further demonstrated the significant impact of the selected factors on yacht tourism promotion. Based on the findings, the researcher concluded that technical support, facilities, and government support have a significant influence on yacht tourism promotion. By capitalizing on the identified factors, policymakers and industry stakeholders can work together to create a favorable environment for yacht tourism, attracting more visitors and fostering sustainable economic development in the region.

Keywords: yacht tourism, technical support, government support, yacht tourism promotion

The Impact of Training on Employee Performance: With Special Reference to the Four-Star Hotels in Colombo

Nanayakkara N.C.D.M[#1], Dharmaratne D.[#2], and Kumara S.N[#3], and Abhayawickrama K.L.H.M [#4]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<nanayakkaradinushi@gmail.com>

Abstract – In today's competitive market, organizations recognize the importance of having employees with positive attitudes towards work as a means to gain a competitive advantage. Training is a crucial factor influencing employee performance and this study aims to investigate the impact of training on employee performance in four-star hotels in Colombo. This quantitative research was conducted using non-probability sampling methods, with a sample size of 384 employees from various four-star hotels in the Colombo district. A structured questionnaire comprising 28 questions was administered to collect data. The study revealed that general training positively enhances employee job satisfaction, motivation, and engagement. The hypotheses were supported, indicating a significant impact of these factors on employee performance. This study establishes a strong correlation between staff training and performance, highlighting the importance of training in improving employee performance. The findings demonstrate that increasing the level of training provided to employees can lead to a higher level of performance. These results have significant implications for organizations in the hotel industry, emphasizing the need to prioritize training initiatives to enhance employee performance. These results provide valuable insights for hotel managers and human resource professionals, guiding them in developing effective training programs that enhance them in developing effective training programs that enhance job satisfaction, motivation, and engagement, ultimately leading to improved employee performance. The findings underscore the need for organizations to invest in comprehensive training programs to foster positive attitudes toward work and gain a competitive edge in the market.

Keywords: Training, Employee performance, Job satisfaction, employee motivation, employee engagement.

Factors Affecting Employee Turnover Intention in Five Star Properties in Sri Lanka (With Special Reference to Colombo District)

Subasinghe S.A.Y.M.[#1], Dharmaratne D.[#2], Kumara S.N.[#3], and Abhayawickrama K.L.H.M.[#4]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC campus, Malabe, Sri Lanka.[1]

<yeshani.malee@gmail.com>

Abstract – Employee turnover is a critical issue that can significantly impact organizational performance. High turnover rates have detrimental effects on business, making it crucial to understand the factors influencing employee turnover intention. This research aims to identify these factors in the context of five-star properties located in the Colombo district of Sri Lanka. Six five-star properties registered under the Sri Lanka Tourism Development Authority were selected as the study sample. The research population comprised employees working in these properties. Out of the anticipated 346 employees, valid responses were collected from 319 individuals, resulting in a response rate of 92.19 percent. Convenience sampling was used as the sampling technique. This quantitative study employed a structured questionnaire with five point Likert scale to assess factors such as work-life balance, job satisfaction, coworker support, and management support. The findings indicate that work-life balance, management support, coworker support, and job satisfaction have a negative influence on employee turnover intentions within the five-star property contest in Colombo district, Sri Lanka. This research contributes to the existing academic literature by shedding light on the specific factors that impact employee turnover intention in the hospitality industry, particularly within the five-star property segment. The results provide valuable insights into management in developing strategies to mitigate turnover and retain talented employees. Further research in this area can explore additional variables or consider different contexts to enhance the understanding of employee turnover and its implications for organizations.

Keywords: Turnover intention, work-life balance, job satisfaction, management support, coworker support.

Logistics Challenges Faced by E-Commerce Retailers in Sri Lanka

Baladora R.S.P. [#1], Rajakaruna J.[#2], and Maheepala H.P.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka1

<hiruni.maheepala@cinec.edu>

Abstract – Electronic commerce (e-commerce) refers to a wide range of online business activities for products and services. Moreover, the emergence of the electronic commerce supply chain (ESC), which consists of e-platforms, manufacturers, and logistics providers, is the result of many manufacturers adopting e-commerce platforms in the current environment. Also, the expansion of ESCs demonstrates the rising significance of logistics. Online shopping, unlike traditional brick-and-mortar retail, frequently entails a physical separation of customers and merchandise, necessitating the involvement of logistics in ESCs. The ESC offers consumers more convenience by overcoming the geographical and temporal constraints of traditional supply chains. The researcher conducted the study to find the logistics challenges faced by e-commerce retailers in Sri Lanka. The objectives of the study are to find the logistics issues faced by e-commerce retailers in Sri Lanka and find the impact of these logistics issues on the operation of e-commerce businesses in Sri Lanka. During this research, self-administered questionnaires have served as the primary method for gathering quantitative data. The correlation analysis indicated that all five variables considered, lack of information sharing, delays in logistics operations, lack of coordination, inadequate skills and expertise, and lack of innovation in services offered had a negative correlation on retailer satisfaction of e-commerce retailers in Sri Lanka, thus accepting all five alternative hypotheses developed for the study. The regression analysis indicated significant predictions for four independent variables (a lack of information sharing, delays in logistics operations, a lack of coordination, and a lack of innovation in the services offered) except for inadequate skills and expertise. Recommending the skills and expertise of logistics service providers can be improved by regularly holding training and mentoring sessions on topics such as professional knowledge of logistics, customs regulations, purchasing capability, delivery management, raw material planning, and storage management.

Keywords: Logistic Challenges, E-commerce, E-commerce Retailers

Internal barriers in adopting green practices faced by third party logistics service providers in Sri Lanka

Kodithuwakku S.D.#1, Ranwala L.#2, and Maheepala H.P.#3

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka

<hiruni.maheepala@cinec.edu>

Abstract – The purpose of this study was to investigate internal barriers to the adoption of green practices faced by third-party logistics (3PL) service providers in Sri Lanka. This study developed a theoretical framework encompassing the ideas of green logistics, 3PL providers, and pertinent theories like the resource-based view through a thorough examination of the literature. A conceptual model was subsequently created based on empirical data to make it easier to analyze the main issue of the study. The dependent variable was the adoption of green logistics techniques, and the model included four independent variables that stood in for barriers: financial limitations, awareness levels, managerial constraints, and human resource constraints. This model's building prompted the creation of hypotheses, which were then tested using data from the research. 139 individuals took part in a survey to investigate the potential associations of the variables. Management constraints, low levels of awareness of the concept, and human resource constraints all had a substantial impact on the level of adoption of green logistics techniques among 3PL operators in Sri Lanka, according to descriptive and correlation analyses of the survey sample. However, the study's results did not confirm the hypothesized effect of financial constraints on the adoption of green logistics by 3PLs. Overall, this study advances knowledge of the internal obstacles 3PL logistics providers in Sri Lanka encounter while implementing green practices. To encourage the adoption of sustainable logistics techniques within the industry, the findings highlight the necessity for addressing gaps in awareness, developing managerial practices, and enhancing human resource capabilities. To overcome internal obstacles and promote the integration of green practices in the Sri Lankan logistics sector, policymakers and industry stakeholders should benefit from these insights.
Keywords: Green practices, Third-party logistics providers, Internal barriers, Green Logistics

Analyzing the Factors Affecting Sustainable Supply Chain Management in The Construction Industry in Western Province, Sri Lanka

Kavinda M.A.P.S[#1], De Silva C.D[#2], and Maheepala H.P[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka1

<hiruni.maheepala@cinec.edu>

Abstract – The construction industry is a significant contributor to the economy of Sri Lanka, and sustainable supply chain management is crucial for ensuring its long-term viability. To meet the objectives of the three dimensions of sustainability (economic, social, and environmental), which derive from the demands of customers and stakeholders, a sustainable supply chain is defined as the management of materials, information, and capital flows, as well as cooperation between companies in the supply chain. This study analyzes the factors affecting sustainable supply chain management in the construction industry in Western Province, Sri Lanka, providing insights for policymakers, industry stakeholders, and researchers interested in improving the performance of local and holistic supply chains in the sector. The primary and secondary objectives respectively are finding the factors affecting and finding the impact of the factors to sustainable supply chain management in the construction industry in Sri Lanka. The study uses a combination of literature review and empirical analysis to identify the most critical factor affecting sustainable supply chain management in the construction industry. Referring to past studies in the world context, factors that could impact supply chain efficiency were tested through hypothesis testing and correlation analysis. All identified factors were significant, and it concludes that the selected factors affect Supply chain efficiency. The identified factors that would impact the supply chain efficiency through correlation analysis were directed to a regression analysis which clearly describes its impact on the dependent variable. Out of six selected independent variables only two variables were identified as significant in the regression analysis which are namely Skilled labor and Waste Management. Recommendations such as Knowledge Management through periodical training & development and focusing on value-added activities and eliminating other non-value-added activities in the supply chain.

Keywords: Supply Chain Management, Sustainable Supply Chain Management, Construction Industry

Impact of Green Supply Chain Management Practices on the Environmental Performance of the Apparel Industry in Sri Lanka

Fernando K.A.J.P.C. [#1], Jayawardena A.M.A.[#2], and Maheepala H.P.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus,

Malabe, Sri Lanka

<jananjana.pasindu123@gmail.com>

Abstract – Nowadays, environmental performance is a challenge for the companies of the whole world. There has been an increasing interest among researchers considering the impact of green supply chain management practices (GSCMPs) on the environmental performance of the apparel industry due to its huge environmental impacts and the rising pressure from the external environment that companies should 'go green'. This study provides valuable insights into the state of implementation of GSCMPs and their impact on the environmental performance of the apparel industry in Sri Lanka. This study is an attempt to study the impact of GSCMPs including Green Purchasing, Eco Design, Green Production, Green Warehousing, Green Delivery, Reuse of Materials, and Material Recycling on the environmental performance of the apparel industry in Sri Lanka with special reference to apparel manufacturing companies in Sri Lanka's Apparel Exporters Association. By adopting a deductive and quantitative approach and using a structured questionnaire data has been collected from an identified respondent in each apparel manufacturing company of Sri Lanka's Apparel Exporters Association consisting of 73 apparel manufacturing companies in Sri Lanka. The study has revealed that GSCMPs have an impact on the environmental performance of apparel manufacturing companies in Sri Lanka's Apparel Exporters Association. Further, only green production and green delivery have a positive impact on the environmental performance of apparel manufacturing companies in Sri Lanka's Apparel Exporters Association, pointing out that this is due to the level of implementation of GSCMPs not sufficient to lead to their better environmental performance. Therefore, the acceptance and implementation of GSCMPs in apparel manufacturing companies should be required, not merely on moral grounds, but for the progressive performance outcomes that companies can achieve.

Keywords: Green Supply Chain Management Practices, Environmental Performance, Apparel Industry

Catering to differently-abled tourists: Identifying knowledge gap amongst Sri Lankan tourist guides

Wickramasinghe A.K.R.N[#1], Nandana S.[#2] , Dharmarathne D.[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2,3]

< sumithra.kumara@cinec.edu>

Abstract – The tourism industry is a major industry with multiple stakeholders. Tour guides are prominent, play a major role in the industry, and are considered unofficial ambassadors. Considering the Sri Lankan context, a significant level of attention has been paid to the experience of the tour guide, but not much attention has been paid to the experience of tour guides with tourists with different abilities. This study mainly aims to explore the knowledge gap between the service provided by a tourist guide and the service expected by a tourist with different abilities through the experiences of a tour guide. The data for this qualitative study were collected by semi-structured interviews with thirty qualified tour guides in Sri Lanka who had experience with tourists with different abilities, and the sample was selected by the snowball sampling method. The study identifies the challenges when interacting with tour guides with differently abled tourists and finds solutions to fill the knowledge gap between tour guides and tourists with disabilities regarding the improvement of accessible tourism. The findings of this study show that the Sri Lankan tourism industry has not given much attention to accessible tourism. Also, this study is beneficial for the practitioners of the tourism industry, stakeholders, and other interested parties in various ways. Awareness programs, training sessions, government intervention, and stimulating tailor-made tour itineraries to promote accessible tourism can be recommended to overcome identified issues.

Keywords: Tour Guides, Accessible Tourism, Differently Abled Tourists, Guiding Experience, Tourism industry.

Identify the potential and ways of promotion of tea tourism in the southern province- of Sri Lanka

Madhubhavani K.D[#1], Nandana S.[#2] , Dharmarathne D.[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2,3]

< sumithra.kumara@cinec.edu>

Abstract – Tea tourism is a typology in the tourism industry. This research examined the potential of tea tourism in the Southern Province and the ways to promote it. The study's flaw is that Sri Lanka has not made its brand of tea available as a tourist product in the southern province. Consequently, the purpose of this study is to clearly define the potential for tea tourism as well as the best strategies for promoting it in the southern province. This study has three objectives. There are ways to identify the potential of the southern province to become a tea tourism destination, to identify ways to promote tea tourism in the southern province and to identify the reasons to promote tea tourism in the southern province. This study is based on a qualitative approach and research coordinated with purposive sampling and thematic analysis methods. These research results are based on in-depth interviews conducted among industry professionals and existing literature on tea tourism. The research covers the current potential and the promotional activities that are already being used by the southern province as a tea tourism destination. The findings of the research suggest that tea tourism in the southern province is still in the development stage and has more potential for growth.

Keywords: Tea tourism, Potentials, Promotions, Southern Province.

Tourists' Perception on Service Quality towards Satisfaction; Special Reference to Unclassified Tourist Hotels in Colombo District

Edirisinghe E.A,N.[#1], Nandana S.[#2] , Dharmarathne D.[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2,3]

< sumithra.kumara@cinec.edu>

Abstract – The world tourism industry encompasses several industries such as transportation, accommodation, attractions, travel, and many others. The Easter attack happened in April 2019, and the tourism industry was struggling to come back to normal. Then there was the COVID-19 pandemic outbreak in 2020, and after 2020, Sri Lanka started to face a massive economic and financial crisis. With these challenges, Sri Lanka was starting to target guests in different tourism markets. Through this research, the researcher aims to find the real tourists' perceptions of service quality toward satisfaction, with a special reference to unclassified tourist hotels in the Colombo District. This research elaborates on different pieces of evidence given by the respondents regarding their experiences related to the service quality of unclassified hotels. The research objectives are to identify service quality factors affecting tourists' satisfaction, to identify tourists' perceptions of service quality toward satisfaction, and to identify recommendations to enhance customer satisfaction in tourist hotels. According to the study findings, tourist service quality directly influences tourist satisfaction. Tourist satisfaction can be checked when a tourist revisits a destination more than once with a positive experience. Study findings way forward to recommend effective communication in the industry, more varieties and multiple options for menus in unclassified tourist' hotels, maintaining facilities according to gazette requirements, and monitoring system implementations for the unclassified tourist' hotel sector.

Keywords: Service Quality, Satisfaction, Tourists' Perception, Unclassified Tourist Hote

Identifying factors affecting passenger satisfaction in Sri Lankan airlines with special reference to in-flight and ground

Ranasinghe R.M.D.H.[#1], Nandana S.[#2], Dharmarathne D.[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2,3]

< sumithra.kumara@cinec.edu>

Abstract – This study was undertaken to identify factors affecting passenger satisfaction on Sri Lanka Airlines, with special reference to in-flight and ground. The specific objectives of the study were to identify the factors affecting airline passenger satisfaction, identify the most significant factors affecting airline passenger satisfaction, identify the relationship between service quality and passenger satisfaction, and identify possible recommendations to improve passenger satisfaction. The academic literature is used to build up a passenger satisfaction model, which is tested by taking into consideration in-flight service quality, in-flight cabin area, in-flight entertainment system (IFE), ticketing and reservation, and baggage service to find out the most important factor that affects passenger satisfaction. A total of 384 respondents were sampled using the convenience sampling technique, and data was collected by sending questionnaires to passengers. Data on the demographic and personal information of the passengers were analyzed using descriptive analysis. Correlation and regression analyses were used to identify the factors affecting passenger satisfaction and the most critical factors affecting passenger satisfaction. Results show that the most important factors are in-flight cabin area and in-flight service quality, while in-flight entertainment system, reservation and ticketing, and baggage service have low significance for passenger satisfaction. The findings of this research study recommended that the management of Sri Lankan Airlines give full attention to its market, identify the market, and cater to it to satisfy its needs and wants. Even though advanced technology is used, most of the passengers need better direction throughout the journey.

Keywords: Passenger satisfaction, Service quality, In-flight cabin, IFE, Sri Lankan Airlines.

Determinants of Passenger Perception on "Carpooling" As a Mobility Improvement in Sri Lanka. [With Special Reference to Malabe Area]

Pathirana R.C.J.[#1],Wijerama P. [#2], De Silva C.D. [#3]

Department of Logistics and Transportation, Faculty of Management and Social Science, CINEC Campus, Malabe Sri Lanka[1], Department of Logistics and Transportation, Faculty of Management and Social Science, CINEC Campus Malabe Sri Lanka[2], Department of Management and Business Studies, Faculty of Management and Social Science, CINEC Campus Malabe Sri Lanka[3]

<Rusiruchayandul5555@gmail.com, dilhanidesilva@cinec.edu>

Abstract – The increase in urban population and the number of private vehicles has resulted in traffic congestion on road networks in Sri Lanka. An increase in traffic congestion tends to increase social costs, like reduced mobility, travel delays, loss of productivity, environmental pollution, etc. So, there is a need to implement alternative travel methods to increase mobility by reducing traffic congestion, and it should also be a sustainable development for society as well as the environment. So, this study aims to identify the factors that would be affected by perceptions of carpooling. It aims to identify the significant relationships between the demographic factors of passengers and their perception of using carpooling. This quantitative research has used a questionnaire to collect data for the study. The survey was conducted among the passengers who are living in the Malabe area, and 385 samples were obtained. The results were processed with SPSS and MS Excel software and analyzed using frequency analysis, regression analysis, and factor analysis. It used eleven independent variables and one dependent variable. Based on these results, the researcher recommends that companies that provide carpooling services adopt appropriate strategies to improve carpooling according to passenger perception. Also, the researcher recommends that future studies should explore the determinants of passenger perception of carpooling not only limited to the Malabe area but also in various regions across Sri Lanka. Further, an emphasis that the use of interview methods rather than use alongside questionnaire surveys to quantitatively capture diverse perspectives and more on understanding of passenger perceptions on carpooling.

Key Words: Carpooling, Traffic Congestion, Travel Behavior

Logistics Involvement in Sri Lanka Army Panagoda Camp and Efficiency

Himal R.S.V.[#1], Dr. Jayasundara P.[#2], De Silva C.D.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe Sri Lanka, Malabe, Sri Lanka[1], KIU Sri Lanka[2], Department of Management and Business Studies, Faculty of Management and Social Science, CINEC Campus, Malabe Sri Lanka[3]

<[sahanhimal@gmail.com, dilhanidesilva@cinec.edu](mailto:sahanhimal@gmail.com)>

Abstract – With the aim of excellent logistical performance, the Sri Lankan army faces significant obstacles. As a result of the deployment of many military bases in regions, the Sri Lankan military is currently placing a significant focus on logistical management issues. Based on this nature, the current study aims to identify the logistics involvement in the Sri Lankan army with special reference to Panagoda Camp and its impact on operational efficiency with a focus on independent variables of supply of suppliers, transportation, inventory planning, and management. The data has been collected from the participants in the study at Panagoda army camp following convenient sampling. The sample includes 40 senior-level to junior-level military personnel who are actively engaged in supply matters. A questionnaire was used to collect the data and followed an interview method where necessary to get clear answers. However, the study has used a mixed method both quantitative and qualitative method analysis to gain a more in-depth understanding of the research title. Further, SPSS software has been used as a data analysis method and the outcome utilized descriptive analysis, correlation analysis, and regression analysis to get the results. So, the findings showed there is a negative relationship between transportation and logistics involvement but a positive impact overall. Also, there is a positive relationship between supply in suppliers and logistics. However, the conclusion was that efficient supply chain management is crucial for exceptional logistic performance, and inventory management has a beneficial bond with influence with logistics. Therefore, adequate inventory helps improve the army forces' efficiency in handling logistics. Further, it suggests a need for research to understand the dynamics of this connection with other variables to see the impact of logistic efficiency.

Keywords: : Logistics Involvement, Efficiency, Sri Lankan Army

Impact of Blockchain Technology on Supply Chain Resilience; A Study Focused on Sri Lanka's Agri-Food Industry.

Senanayake A.S.W. [#1], Medawatage A.[#2], De Silva C.D.[#3]

Department of Logistics and Transportation, Faculty of Management and Social Science, CINEC Campus, Malabe Sri Lanka[1], Department of Logistics and Transportation, Faculty of Management and Social Science, CINEC Campus Malabe Sri Lanka[2], Department of Management and Business Studies, Faculty of Management and Social Science, CINEC Campus Malabe Sri Lanka[3]

<adhithyasenanayake@icloud.com, dilhanidesilva@cinec.edu>

Abstract – In today's world, supply chain resilience has become a major focus for many industries, with the agricultural food sector receiving special attention. Many factors affect because like rising demand, crises, natural disasters, fraud, food safety issues, and the necessity of transparency and traceability, all of which have serious negative effects on the global economy, environment, and society. Consequently, the current study acknowledges that it is especially difficult to achieve supply chain resilience in the food business, calling for creative solutions. So, the study is searching how blockchain technology is influencing supply chain resilience to address the issues and improve the overall resilience of the food supply chain. This study aims to identify the existing problems faced by the Sri Lankan food supply chain, evaluate the blockchain factors that influence supply chain resilience, and further arrive at conclusions, and recommendations on building a resilient supply chain in the Sri Lanka food industry. In this study questionnaire was used to collect the data and it was gathered from 151 respondents using simple random sampling within the Sri Lankan Agi food industry. The data were analyzed using the SPSS software with reliability analysis, demographic factor analysis, descriptive analysis, correlation analysis, hypothesis testing, and regression analysis. However, the results show that the Sri Lankan food industry lacks proper traceability and transparency, leading to trust and accountability issues among stakeholders, and proposed recommendations to improve the situation, including implementing a traceability system, using technology to improve transparency, and establishing a regulatory body. Further, in future studies, it recommends focusing on the implementation and effectiveness of the proposed suggestions in improving the traceability and transparency of Sri Lanka's food supply chain.

Keywords - Supply Chain Resilience, Blockchain Technology, Supply Chain

The Impact of Social Media Marketing on Decision Making of Domestic Travelers: Special Reference to 05 Star Hotels in Colombo District

Seneviratne W.M.L [#1], Nandana S & Dharmarathna D [#2] Pavithra H.D[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<dashini.pavithra@cinec.edu>

Abstract –Social media is a bevy of websites and applications in which people can create content and share, build partnerships, and assemble social networks in many aspects that can be influenced and developed into something creative and beneficial. In an era where of Internet solves almost all problems, corporate companies have also focused on getting help from the Internet Hence, social media marketing is becoming prominent day by day as a mechanism of reaching customers. This study mainly focuses on addressing the gap in identifying what are the factors affecting social media marketing on decision-making and the extent to which social media marketing impacts domestic travelers' intentions and factors influencing domestic travelers' intentions. A quantitative study is being conducted with questionnaires as an aid in collecting data from a sample of 384 domestic travelers. With the help of the SPSS analytical tool, a correlation analysis and multiple regression analysis were conducted to evaluate the factors influencing the decision of domestic travelers and to identify the significance of each variable. Based on the analysis it was concluded that Reviews on social media, Promotions on social media, Influencer Marketing, and Content Marketing have a great impact on domestic travelers' decision-making behavior. Moreover, it was found that 76.9% of travel decisions are influenced by social media marketing according to the model summary of regression analysis. In conclusion, domestic travelers' decisions are heavily influenced by social media marketing. To attract and retain customers, travel companies must use social media platforms for customer engagement, product promotion, influencer collaboration, and content creation. If they accomplish this, they will see an uptick in bookings, revenue, and client loyalty, all of which bode well for their future in the travel business.

Keywords: Domestic Travelers, Social Media Marketing, Regression Analysis

Factors Influencing the Choose of Cycling as a Sustainable Mode of Transport in the Colombo Metropolitan Area.

Pabasara A.M.S.[#1], Wijerama P.[#2], De Silva C.D.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1], Department of Logistics and Transportation, Faculty of Management and Social Science, CINEC Campus, Malabe, Sri Lanka[2], Department of Management and Business Studies, Faculty of Management and Social Science, CINEC Campus, Malabe, Sri Lanka [3]

<samadhi9821@icloud.com, dilhanidesilva@cinec.edu>

Abstract – Globalization, urbanization, and sub-urbanization processes have given rise to numerous high-growth areas around the world, which also have an impact on accessibility and transportation. Individuals who live in large cities have decreasing amounts of free time and travel frequently during the day. As a result, there are more cars in urban areas. As a result, transportation networks need to be constructed. This is a typical issue, particularly in urban areas and densely populated areas. As CO2 and exhaust emissions rise, cities become more and more filthy. Motorized transportation also raises noise levels, which directly affects people's health and well-being. This study addresses the solution to these problems, and factors influencing to choice of cycling as a sustainable transport mode in the Colombo Metropolitan area. The survey included a total of 334 responses who used cycling in Colombo. A Google form-based structured questionnaire was used to collect the data. Version 27 of the SPSS statistical analysis program was used to examine the data. There was a total of eight factors that were considered as independent variables in the study, including cost-effectiveness, traffic congestion, human health, infrastructure availability, environmentally friendly, rules and regulations, parking facilities for cycling, and people preference. The research data analysis showed that through the correlation analysis, all four variables have been positively correlated with the choice of cycling. There are several advantages to cycling for both individuals and society at large. Cycling can benefit a person's health and fitness, lower stress levels, and reduce the cost of transportation. Cycling benefits society by easing traffic congestion, enhancing air quality, and promoting a more egalitarian and sustainable transportation system. Overall, cycling is a realistic and appealing alternative for both individuals and communities due to its many advantages as a means of transportation.

Keywords: Sustainable Transportation, Benefits of Cycling, Colombo Metropolitan Area

Factors Affecting Customer Satisfaction on Domestic Courier Services in Colombo District

Karunadhara I.S[#1], Wijerama P [#2], Pavithra HD [#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<dashini.pavithra@cinec.edu>

Abstract – The domestic courier services sector, at the forefront of the logistics market, is growing rapidly. The conventional Express Mail Service's stronghold has been broken by the emergence of new private courier businesses with competitive pricing and flexible services. The courier services sector has been able to rebound from the recent global economic recession. The e-commerce sector has unquestionably had a tremendously positive impact on the courier industry. Since the well-being of the Domestic courier service completely depends on customer satisfaction, this study aims to address the gap in identifying factors influencing customer satisfaction with domestic courier services in Sri Lanka with special reference to the Colombo district. The researcher followed a quantitative study to attain the research objective of identifying the factors affecting customer satisfaction and the degree of its influence. To collect data, the aid of a questionnaire was obtained which was distributed among 384 domestic courier customers selected based on the simple random sampling technique. Factor analysis test, Multiple regression analysis, and a correlation test were conducted in analyzing the collected data. Accordingly, the research findings indicate that the cost and consistency of the courier service have a significant impact on customer satisfaction while other factors that positively influence customer satisfaction are punctuality, Safety, Trust, and Efficiency of customer service. In conclusion, several factors should be prioritized in delivering customer satisfaction in the domestic courier industry. The significance of the study lies in its ability to act as a guide for numerous organizations in deciding on how to improve customer satisfaction.

Keywords: Customer Satisfaction, Courier Services, Multiple Regression Analysis

Analysis of Factors Affecting the Consumer Purchasing Behavior in Supermarkets in Colombo, Sri Lanka
(With Special Reference to Generation Z)

Mortier N.D[#1], Siriwardena S[#2], Pavithra H.D[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<dashini.pavithra@cinec.edu>

Abstract - Supermarkets play a vital role in the economic life of countries, as they are a source of retailing food items and other everyday essentials that are required for people to live. It is of the utmost importance for these stores to stay in tune with the needs of their customers and ensure that their needs are met in a timely and efficient manner. By doing so, supermarkets can remain relevant. The majority of the younger generation has switched to purchasing at supermarkets either in-store or through their respective websites. Due to their extensive product and service knowledge, today's young generation has a greater influence on these supermarkets than the past generations had. Hence, the research tries to address the gap between identifying the factors that affect the purchasing behavior of Generation Z consumers in supermarkets and determining the impact of these factors on their decision-making. The main objective of this study is to identify the factors that affect consumer purchasing behavior in supermarkets in the Colombo area, with special reference to Generation Z and the degree of influence of those observed factors on consumer purchasing behavior. The author followed a quantitative study using a 5-point Likert scale questionnaire as an aid in the collection of data. A sample of 363 respondents from Gen Z was selected for the survey based on the simple random sampling technique in the study area of the Colombo district. As per the data analysis done by Correlation and multiple regression analysis, what mostly has the power to persuade consumers to purchase goods from supermarkets, is product quality, service quality, convenience, physical appearance, personal interaction, and assortment. Overall, the findings of the research provide a comprehensive framework for local and international retail chains to create effective and informed marketing strategies by analyzing consumer profiles and purchasing habits in supermarkets.

Keywords: Consumer Purchasing Behavior, Supermarkets, Generation Z.

An Analysis of International Tourists' Satisfaction in Madu River Boat Safari at Balapitiya.

De Silva M.T.W[#1], Karunarathne N[#2], Pavithra H.D[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<dashini.pavithra@cinec.edu>

Abstract —Wetland tourism has become one of the most popular tourist activities in Sri Lanka. A separate tourist group with a focus on the charms, scenery, and biodiversity of wetland sites, as well as boat safaris and other activities, is referred to as ecotourism. The Madu River is a well-known natural wetland location that is mostly used for boat safaris and other tourism-related activities. The location has been impacted by the rising tourist numbers in both positive and negative ways. The objectives of the research are to identify what are the opinions of tourists on the current tourism activities in Madu River and how those opinions have raised issues and problems in gaining satisfaction about tourism activities. Hence, the study mainly addresses the research question as to what the current tourism operations in Madu Ganga and their impact on tourist satisfaction, what the issues with sustainable tourism development in Madu River, and recommendations for those issues. Since this study evaluates the opinions of the tourists a qualitative study is being conducted with the collection of both primary and secondary data. A semi-structured interview was conducted among a combination of 25 local and foreign tourists who were selected based on the convenience sampling technique. Based on the thematic analysis of the data collected several factors influence the tourist satisfaction level including attraction of the tourism location as a highly influential factor according to the survey respondents. Other than that Price and Payment as well as the Security of the location were among the critical factors influencing tourist satisfaction. Furthermore, the researcher identified that the quality of boats, attractions, and services, safety and guide services, and information are also influential factors affecting tourists' overall satisfaction with the Madu River tourism industry.

Keywords: Tourist Satisfaction, Qualitative Study, Thematic Analysis

Factors Affecting Customer Satisfaction that Affect Service Quality: A Case Study Based on Evergreen Shipping Lanka

Siriwardane, B. M. H. H[#1], Ranwala, L[#2], and Panamaldeniya, A. A. M. A. K[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2]
Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[3]

<ashvini.panamaldeniya@cinec.edu>

The main goal of this research is to identify the factors affecting customer satisfaction with Evergreen Shipping Lanka, one of the leading shipping lines in Sri Lanka. Satisfying customer needs is the primary requirement for survival in a competitive market and it is important to identify how well the company performs in the industry, and how the company fulfills the customer expectations. The customer satisfaction survey is an effective tool to inquire about what customer needs and expects. Accordingly, identifying the variables affecting customer satisfaction is considered one of the main objectives of this study. Suggestions for improvement in the service quality of Evergreen Shipping Lanka were proposed based on the results of the survey and applied theories. Researchers use various methods to evaluate customer satisfaction on service quality, which is being offered to the client. The case was conducted using a quantitative research method. Online questionnaires, over-the-phone, and face-to-face approaches were used for data collection. Statistical information was processed with MS Excel and SPSS software and analyzed using demographic factor analysis, cross-tabulation analysis, chi-square test, reliability analysis, and correlation analysis. Data collected from 201 respondents were analyzed using the exploratory factor analysis. 16 Variables were grouped into 2 factors, namely effectiveness and affordability and coverage and reliability. Based on the results of the study it was identified that the majority of customers are not satisfied with the service quality of Evergreen Shipping Lanka. Hence, the study recommends to improve the service quality of Evergreen Shipping.

Keywords: Customer Satisfaction, Service Quality, Evergreen Shipping Lanka

The Impact of Procurement Practices on Organizational Performance with Special Reference to Coir Industry

M.P. T. N. Mudalinayaka[#1], Jayawardane. A. M. A [#2], and Panamaldeniya. A. A. M. A. K[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[2,3]

<ashvini.panamaldeniya@cinec.edu>

The term procurement describes actions taken by a business to manage the supply chain effectively. Manufacturing companies might modify the purchasing procedures to increase productivity and encourage the conservation of the environment. In the Sri Lankan context, empirical evidence on the functioning of procurement practices and organizational performance is difficult to find. Accordingly, the goal of this study is to ascertain how procurement methods impact organizational performance in the coir industry. This study aimed at increasing procurement department efficiency and effectiveness to boost overall organizational performance. Employees of four organizations related to the coir industry made up the study population. The researchers adopted convenient sampling and data were collected through a questionnaire. Statistical information was processed with SPSS software and data collected from 153 respondents were analyzed using descriptive analysis, correlation, and multiple regression analysis. The study revealed a positive impact of buyer-supplier relationships, adoption of information technology, ethical practices, and green purchasing on organizational performance. Further, the regression model of the study revealed that green purchasing is the most important determinant of organizational performance. Accordingly, the implementation of solid procurement practices can be considered a key element to the successful operation of organizations in the coir industry. The study concluded that practices like ERP system implementation would have a great impact on enhancing accountability and faster response time, recycling products, and reducing wastage, which will ultimately have a high impact on organizational performance.

Keywords: Procurement Practices, Organizational Performance, Coir Industry

Analyzing the Factors Affecting Passenger Perception of Implementing Green Transportation Concept in Colombo City

Anjala, A. D. P[#1], Menike, D[#2] and Panamaldeniya, A. A. M. A. K[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]
Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[2]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[3]

< ashvini.panamaldeniya@cinec.edu >

The main goal of this research is to identify the factors affecting passenger perception of implementing green transportation concept in Colombo city. Green transport or sustainable transport can be considered as a poorly implemented concept in Sri Lanka. Considering the pollution and higher density in the Colombo district, the green transport concept provides new highlights. The study implemented a passenger perception survey to inquire about what passengers need and expect. Suggestions for improvement in the service quality of public bus transport were proposed based on the results of the survey and applied theories. Researchers use various methods to evaluate customer satisfaction on service quality, which is being offered to the client. The study used a quantitative research method. Online questionnaires and a face-to-face approach were used for data collection. Statistical information was processed with MS Excel and SPSS software and analyzed using demographic factor analysis, cross-tabulation analysis, chi-square test, reliability analysis, correlation analysis, and Kruskal Wallis test. Data collected from 303 respondents were analyzed using the exploratory factor analysis. 20 Variables were divided into 5 factors namely, service, convenience, operational, customer value, and safety factors. The study revealed that most passengers are satisfied with the service quality of public bus transport. Further, the study identified that there are some important variables where passengers were unsatisfied, including availability of seats, bus stop maintenance, frequency of the bus, and speed of the bus.

Keywords: Passenger Perception, Green Transport, Colombo City

Analysis of the Factors Affecting Passengers' Satisfaction on Mobile App-Based Transport Services: with Special Reference to Gampaha District.

Weerasooriya W.P.T.D[#1], Siriwardena S[#2], Balasooriya A.B.S.T[#3]

Department of Logistics and Transport, Department of Logistics and Transport, Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<sachinitharaka111@gmail.com>

Abstract – The transportation sector plays a pivotal role in serving the needs of a nation and its populace, acting as a vital link that connects people, services, and daily necessities. In the era of technological evolution, the way business is conducted has undergone significant changes, with online platforms providing unprecedented accessibility. Mobile and internet-based platforms have simplified information exchange for transport purposes, making it more convenient for travelers. This study focuses on the factors influencing users of mobile app-based transport services in Sri Lanka, specifically within the Gampaha district. The primary objective is to analyze the individual associations and impacts of these factors on passenger satisfaction. The SERVQUAL model is employed, identifying customer satisfaction as the dependent variable and service quality factors and demographic variables (such as age, gender, and monthly income) as independent variables. The research adopts a quantitative approach, utilizing online questionnaires and the convenience sampling method. Statistical tools, including the Statistical Package for Social Sciences (SPSS), Pearson Correlation Coefficient, and Multiple Linear Regression model, are employed for data analysis. The study reveals that reliability, responsiveness, tangibles, empathy, and assurance exhibit a positive relationship with customer satisfaction. Recommendations are provided for enhancing future improvements in mobile app-based transport services. In conclusion, the study underscores the critical role of technology in shaping the transport industry and highlights key factors influencing customer satisfaction in mobile app-based transportation in Sri Lanka. The findings and recommendations contribute valuable insights for stakeholders aiming to enhance the quality and effectiveness of these services.

Keywords: Mobile App, Service quality factors, customer satisfaction, technology, ride-hailing, SERVQUAL

The Impact of Green Logistics Practices on Financial Performance of Export Manufacturing Companies in Sri Lanka With Special Emphasis on Colombo Stock Exchange Listed Companies.

Jayasekara J.A.N.S[#1], Nilushika.A[#2], Balasooriya A.B.S.T[#3]

Department of Logistics and Transport, Department of Logistics and Transport, Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<Sachini.tharaka@cinec.edu>

Abstract - This study explores the impact of green logistics methods on the financial performance of Export Manufacturing Companies in Sri Lanka, filling a gap in the existing literature and addressing the absence of a standardized set of green logistics methods in the Sri Lankan context. The author focuses on large-scale organizations with ISO 14000 certification throughout Sri Lanka, utilizing a quantitative testing strategy with both primary and secondary data sources. The study's population consists of 296 enterprises, with a sample of 128 selected through convenient sampling. Employing various statistical analyses such as Reliability analysis, Cross Tabulation analysis, independent sample t-test, One-Way ANOVA, Descriptive analysis, Frequency analysis, Factor analysis, Correlation analysis, and Regression analysis, the study employs SPSS version 25 for data analysis. All six hypotheses posited in the research are accepted, indicating a positive influence of green logistics techniques on financial performance. The findings emphasize the importance of green warehouse management, green transportation, green procurement, green office management, and green packaging management in enhancing financial performance. The study underscores the need for managers and organizations to gain a comprehensive understanding of these green logistics techniques to optimize their financial outcomes. In conclusion, this research contributes valuable insights into the field of green logistics in the Sri Lankan context and offers practical recommendations for organizations aiming to improve their financial performance through sustainable practices.

Keywords: Green Warehouse Management, Green Transportation, Green Procurement, Green Office Management, Green Packaging Management

T Analyzing the Impact of Logistics Service Quality on Customer Retention in B2C E-Commerce in Sri Lanka

Lankapura T. I.[#1], Siriwardena S [#2], Nisansa M. D. S.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

< thilinilankapura@gmail.com>

Abstract – Over the last few decades Information Technology has become one of the main tools that could pose a significant impact to rapid global development resulting in electronic commerce (e-commerce) to be originated one of the major innovations in the decade. E-commerce simply refers to buying and selling goods through the Internet. With the Covid-19 pandemic E-commerce has become one of the major shopping tools in Sri Lanka. The escalating competitiveness within the B2C e-commerce domain, characterized by growing new market participants, presents considerable challenges in ensuring sustained customer satisfaction and retention. To compete in the developing e-commerce market retailers need to focus more on the quality of service provided and they need to ensure customers are retained. Within this framework, the role of logistics service quality emerges as a critical focal point given its significant influence on the entirety of B2C e-commerce. The study focuses on analyzing the impact of logistics service quality factors on customer retention in B2C e-commerce moderating the variable customer satisfaction. The main objective of this study is to analyze the impact of logistics service quality on customer retention and the secondary objective is to analyze the impact of customer satisfaction on the relationship between logistics service quality and customer retention.

Using a deductive and quantitative design, data is collected through a questionnaire that was distributed among 385 customers who use B2C e-commerce. Initially, the research gap was discussed and used to create the conceptual framework. It can be concluded that order quality, delivery quality, information quality, customer complaints return policy and perceived price have a positive impact on customer retention. The recommendations were provided for the retailers to improve logistics service quality to have better customer satisfaction and retention.

Keywords: Logistics Service Quality, Customer Retention, Customer Satisfaction, E-commerce, B2C

Factors Affecting to Service Quality of Freight Forwarders in Colombo City Limit

Wickramanayake G. N. I.[#1], Dissanayaka S.[#2], Nisansa M.D.S.[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1]

< nisankaisu97@gmail.com>

Abstract – The freight forwarders play a vital role in the logistics industry for facilitating international trade by providing services such as transportation, warehousing, customs clearance, and documentation. In Sri Lanka, the freight forwarding industry has been growing in recent years, with an increasing number of companies entering the market to meet the growing demand for logistics services. The importance of service quality in the freight forwarding industry cannot be overstated, as it directly affects customer satisfaction and loyalty. However, with the increase in players, the quality of services provided by freight forwarders has become a major concern for both customers and the industry. Furthermore, there is a lack of understanding of the factors that affect the service quality of these companies in Sri Lanka. The research seeks to identify the most significant factors that affect service quality and evaluate the current service quality to identify areas for improvement. The population consists of shippers who have used the services of freight forwarding companies in Colombo city while the sample is limited to shippers who have had experience with the freight forwarding services within the past 12 months. The research is based deductive approach and a quantitative design whereas the data is collected through online questionnaires. It can be identified that Freight Options and Freight Services have a positive direct effect on the service quality of freight forwarders in Colombo city limits. On the other hand, Shipping Quality does not have a significant direct effect on the service quality of freight forwarders in Colombo city limits. In conclusion, the availability and quality of freight options and services play a crucial role in enhancing the service quality of freight forwarders in the Colombo city limit.

Keywords: Road Transport, Productivity of Agriculture industry, Quality, Price, Safety, Reliability, Accessibility, Duration of Delivery

Identifying Factors which Determine the Demand for "Stopover Tourism" in an Airport, with Reference to BIA, Katunayaka

.Weerasinghe H.D.M.A.L[#1], Basnayake.K [#2], and Uththara Y.A.D.I[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC campus, Malabe, Sri Lanka

< meghalakmali@gmail.com >

Abstract –Stopover tourism is a new tourism typology created and promoted with the involvement of three main stakeholders: airports, airlines, and destination management organizations. This concept has provided opportunities for the above-mentioned stakeholders to increase revenue from commercial activities. It is also regarded as a great opportunity for transit air passengers to overcome the boredom and tediousness during airport transit hours. The main objective of this study is to identify the factors that determine the demand for stopover tourism in an international airport. Therefore, the identified factors can be analyzed to see those that apply to BIA, Katunayaka. For that purpose, initially, six independent variables were identified using the current literature, and six hypotheses were built up based on their assumed relationship with the "demand for stopover tourism". The primary data were collected from 384 respondents using a questionnaire and statistically analyzed to test the previously constructed hypotheses. At the end of the analysis, was proved that the availability of attractions, accessibility, amenities, available packages, ambiance, and regulatory frameworks have a significant impact on the demand for "stopover tourism". Therefore, it was concluded that the development of such components within BIA, Katunayaka would help it to position as a major "stopover" destination in the Asia-Pacific region. Apart from developing facilities, developing a strong marketing strategy can be recommended as an essential factor in promoting stopover tourism at the Colombo airport.

Keywords: Stopover tourism, BIA, Attractions, amenities, accessibility, airport, available packages, ambiance, regulatory frameworks

Sustainable Strategies to Promote Four Lesser-Known Potential Tourist Destinations in Matale District

. Ekanayaka E.M.N.P.B[#1],Basnayake K [#2] and Uththara Y.A.D.I[#3]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC campus, Malabe, Sri Lanka

< pinimalbandara12@gmail.com >

Abstract – Tourism is the most important part of the economy surrounded by a beautiful coastline natural environment and historical values. These tourist attractions are spread across the nine provinces of Sri Lanka. While the Matale district of Sri Lanka does not pay attention to promotional purposes. There are a lot of lesser-known attractions that can be identified for promotional purposes. In addition, the existing attractions of the Matale district have not been transmitted to the public. Among those lesser-known destinations, they are introduced by selecting four attractions that belong to the Matale district. Apart from that, also discusses how they should be promoted sustainably. In addition, a comprehensive analysis has been done on the study area of Matale district related to this study topic. An analysis of the tourism industry and other facts of Matale district has been done. To make data analysis easier to improve consistency, this study used SPSS for quantitative analysis and any available data (web, newspaper, article, magazines) for qualitative analysis. By conducting a data analysis related to the four places that were taken as the basis for this study topic, information has been searched about the social awareness of these places and an understanding of the potential for the sustainable promotion of these places has been done.

Keywords: Matale district, Sustainable Tourism, Promotion, Development

Analyzing the impact of occupational stress on the perceived employee performance (With special reference to the events management sector in the Western Province)

.Dissanayake P.D[#1],Dharmaratne D [#2], Kumara S.N [#3]and Uththara Y.A.D.I[#4]

Department of Management and Business Studies, Faculty of Management and Social Sciences, CINEC campus, Malabe, Sri Lanka

< prabhashiduishenka98@gmail.com>

Abstract – High demand and the complexity of the market create high stress among employees. Employee occupational stress is crucial since it can negatively impact both the performance and general well-being of both individuals and organizations. Stress is frequently brought on by modern corporate companies that operate in difficult and demanding marketplaces. There are some arguments that for people to succeed at higher levels, a certain amount of stress is necessary while some believe they will operate more effectively if given a low level of stress. Organizations are creating new job positions, though, to get more out of their human resources, and those who can manage these complexities will be rewarded. The main objective of this study is to identify the impact of occupational stress on the perceived employee performance of the Events Management Sector particularly in the Western Province of Sri Lanka. Primary data was collected through structured questionnaires from 381 event management employees in the Western Province of Sri Lanka. The quantitative analysis method was used to analyze the data and the convenience sampling method was used as the data collecting technique. Validity and reliability test, Descriptive analysis, KMO and Bartlett's analysis, Correlation analysis, and Regression Analysis, were used to analyze the data with the support of the SPSS 16.0 version., revealed that work-related stress, organizational stress, and individual stress have a positive impact on the perceived performance of the employees. Furthermore, the study provides recommendations and suggestions to event management sector human resource managers to reduce employees' stress based on the result of the study which will increase the performances of the employees eventually.

Keywords: Occupational Stress, Perceived Employee Performance, Events Management, Work Stress, Sri Lanka

Overcoming Challenges when Adapting Warehouses for a New Product or Changing Requirements in the Western Province of Sri Lanka

Perera W.A.I.U[#1], Hettiarachchi S[#2], Ediriweera T[#3]

Department of Logistics and Transport, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1, 2,3]

<isuruudayanga1998@gmail.com>

Abstract – Effective warehouse management (WM) is critical in the dynamic global economy, changing customer demands and a wide variety of products crossing complex supply networks. This research focuses on the Western Province of Sri Lanka, a key economic hub hosting numerous 3PL providers, import-export businesses, and warehousing enterprises. Data was collected from 121 out of 175 population (warehouse managers, executives, operational staff, and industry related students) through online Google surveys, interviews, and literature reviews. Employing statistical methods like One-Way ANOVA, descriptive analysis, frequency analysis, and correlation analysis, the research reveals challenges in adapting warehouses to new products and changing demands. It identifies critical factors affecting warehouse efficiency, including evolving customer expectations and efficient inventory management. The conclusion consists of managing inventory, utilizing warehouse space effectively, improving order fulfillment, implementing technology, considering external factors, allocating resources wisely, and managing finances. It contributes to an enhanced comprehension of how evolving market trends impact warehousing operations and provides valuable insights for mitigating future challenges. Focusing on the Western Province, where warehouse-related businesses are most concentrated, the study proposes effective solutions to optimize WM practices in response to dynamic market dynamics. The objectives revolve around understanding the challenges of adapting warehouses to new products and evolving requirements within the area. It evaluates strategies for profitably overcoming these challenges and explores the tools and practices used by 3PL and private warehouses to mitigate operational issues. The research not only identifies the factors influencing WM challenges but also highlights six primary issues faced by warehouses in the Western Province, offering practical recommendations to enhance efficiency and management.

Keywords: Customers' demand, Adapting warehouses, Warehouse efficiency, Inventory management

Analyzing Transportation Demand Management as a Strategy to Manage the Traffic in Colombo Metropolitan Area

Amarasinghe H.D.S.P[#1], Jayakody J.A.G[#2]

CINEC Campus, Malabe, Sri Lanka[1], University of Moratuwa, Sri Lanka [2]

<amarasinghesathi@gmail.com>

Abstract – This research aims to analyze transportation demand management (TDM) as an effective approach to handle traffic congestion in the Colombo Metropolitan Area. TDM reduces traffic through optimizing resources rather than road construction. It is the central focus of the study. Besides, it primarily aims to identify the factors contributing to traffic in the area, specifically focusing on the availability and accessibility of alternative modes of transportation, travel behavior and preferences, transportation pricing and incentives, and employment patterns and work schedules. It discusses the effectiveness of transportation demand management strategies in mitigating traffic congestion. A structured questionnaire survey was conducted, collecting data from 365 daily commuters in the Colombo population, including those traveling during both peak and off-peak hours, using simple random sampling method. The data was analyzed using Regression analysis, Correlation analysis, and Test of Independence. The Regression Analysis revealed that all four independent variables were statistically significant and influenced traffic congestion. Correlation analysis indicated that employment patterns and work schedules had the strongest positive correlation with traffic congestion, whereas transportation pricing and incentives exhibited the weakest positive correlation among the significant factors. The Test of Independence indicated significant associations between traffic congestion and the selected factors, aligning with the outcomes derived from Correlation analysis and Regression analysis. Moreover, it was concluded that employment patterns and work schedules had a significant positive influence on traffic congestion, while transportation pricing and incentives had a detrimental impact. Further, it was identified that introducing flexible work schedules, particularly during off-peak hours, offers a promising solution to alleviate traffic congestion. The results provide a basis for developing effective strategies to control road accidents, mitigate traffic congestion and improve transportation efficiency in the area. In the future, the regression model will be developed into a forecasting model.

Keywords: Transportation demand Management, Traffic congestion, Employment patterns

Analyzing the Impact of ERP Systems on Operational Performance in Apparel Logistics in Sri Lanka

Perera P.V.R[#1], Rajakaruna R.J.P.K[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences, CINEC Campus, Malabe, Sri Lanka[1,2]

<randikavihanga4@gmail.com>

Abstract – Enterprise Resource Planning (ERP) systems are integral in enhancing the operational performance of apparel logistics today. The research aims to identify the factors influencing the operational performance of Sri Lankan apparel logistics through the implementation of ERP systems and to analyse the impact of ERP systems on the operational performance of Sri Lankan apparel logistics. The independent variables have been extracted from the DeLone & McLean, 2003 model to analyse the impact on operational performance of Sri Lankan apparel logistics. The sample consisted with 392 respondents and the sample is obtained through convenience sampling technique. The study follows the deductive approach. Moreover, a structured questionnaire has been offered to the respondents to gather primary data. The study has unveiled several significant findings regarding the relationships between the independent variables of service quality, information quality, and system quality, and their impact on the operational performance of apparel logistics. Notably, all three independent variables exhibit positive correlations with the dependent variable of operational performance. Moreover, the analysis has identified that service quality exerts the most substantial influence on the operational performance of apparel logistics. This is evident in the coefficient value of 0.552, indicating the highest level of impact among the three independent variables. Additionally, information quality demonstrates a positive correlation with an associated coefficient value of 0.409, while system quality also contributes positively with a coefficient value of 0.353 to the operational performance of apparel logistics. The findings from this research will offer valuable insights to a wide range of stakeholders, including ERP service providers, apparel companies, researchers, and professionals engaged in this field.

Keywords: Apparel logistics, ERP system, Information quality, Operational performance, Service quality, System quality

Factors Affecting on Streamlined Customs Import Clearance Operations with Special Reference to Sea Cargo FCL Consignments, Evidence from Sri Lanka

Hettiarachchi H.P.B[#1], Madushani G[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

*CINEC Campus, Malabe, Sri La*nka[1,2]

<bhathiyahettiaracchchi49@gmail.com>

Abstract – The efficiency of import customs clearing operations for sea cargo Full Container Load (FCL) consignments is of utmost significance to the domestic economy of Sri Lanka, which heavily relies on imports. Over the recent years, Sri Lanka Customs has undertaken diverse strategies, yielding both positive and negative impacts on the cargo clearance process. Nevertheless, notable challenges persist, necessitating a comprehensive exploration of the factors influencing import cargo clearance operations, with specific emphasis on sea cargo FCL consignments. This study utilizes a qualitative research approach with a mono method and follows a deductive process. Data collection involved an online survey conducted with 200 respondents who are presently registered as Customs house agents in Sri Lanka. The survey questionnaire was constructed based on a carefully designed conceptual framework, operationalized variables, and finalized hypotheses. The collected data were subsequently analyzed using SPSS statistical software. The Sri Lanka Customs department plays a pivotal role in this process. Analysis of demographic data reveals a male-dominated industry, with 72.7% of customs house agents and staff being male. Most respondents fall within the 18-25 (61.3%) and 26-35 (32.7%) age groups, indicating a youthful workforce. The study's results confirm that three factors - Risk Management, Training and Development, and Customs Automation - affect the efficiency of custom import clearance operations. All the alternative hypotheses put forth in the study were supported. Notably, Customs Automation emerges as the most influential factor in improving the efficiency of these operations. This suggests that each independent variable influences the efficiency of streamlined import customs clearance operations. These research findings can guide the customs industry in taking constructive steps to address these challenges and ultimately safeguard the interests of importers and exporters in Sri Lanka.

Keywords - Import customs operations, Customs automation, Trade facilitation

Factors Affecting Passenger Distress when Travelling by Public Buses During Peak Hours in Colombo District

Imalsha Peiris M.P.W.P[#1], Thathsarani A.A.T[#2], Ediriweera T[#3]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,
CINEC Campus, Malabe, Sri Lanka[1,2,3]

<piumiimalsha1@gmail.com>

Abstract – The growing urbanization and population density in Colombo have increased public transportation demand, especially during peak hours. This study aims to identify factors, examine the relationship, and find the most effective strategic innovations that can be applied to Sri Lanka. It employed a quantitative experimental research approach involving two sets of independent and dependent variables and using a structured passenger survey to collect data from 384 public bus users who use 120 (Pettah-Piliyandala/Kesbewa) bus route in the Colombo district by using a random sampling method. This research goes beyond the physical aspects and considers psychological, social, and environmental factors. The study was based on five main factors: service quality, comfortability, operational performance, safety and security, sexual harassment. The survey instrument includes questions related to passenger distress, perceived causes, and impact on the overall travel experience. A Reliability and validity were measured using Cronbach's alpha and normality tests. A regression ANOVA represented service quality, operational performance, and sexual harassment as the most critical factors. The results revealed that overcrowding, long wait times, inadequate service planning, insufficient buses, uncomfortable seating and temperature, poor customer service significantly affect passenger distress during peak hour bus travel. The study presented short-term and long-term strategic innovations to reduce passenger distress based on cost and time consumption. The findings of this study provided valuable insights into the key factors affecting passenger distress and helped policymakers, public transportation authorities, and bus operators develop strategies to enhance the quality of the service. By understanding these factors, appropriate interventions can be implemented to mitigate passenger distress, improve customer satisfaction, and promote the usage of public transportation as a sustainable mode of commuting.

Keywords: Passenger distress, Public buses, Peak hours

Factors Affecting to Container Inventory Management [CIM] in Container Depots in Sri Lanka

Gunathilake M[#1], Siriwardana S[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1,2]

<manishigunathilake@gmail.com>

Abstract – Container inventory and management (CIM) is an integral part of running a successful container logistics operation, allowing for best-in-class container utilization and low-cost operations. Ineffective container inventory management has become a fairly widespread concern in the shipping industry. carrier's extensive fleet is essentially useless if it is not managed effectively and efficiently. The container inventory can be managed effectively to maintain a smooth balance between supply and demand while reducing potential extra expenses by adhering to efficient and effective procedures. This paper proposes some factors affecting to container inventory management [CIM] in Container depots in Sri Lanka. Accordingly, a target population of 384 senior employees in the field are followed by a questionnaire survey have been carried out and data were analyzed mainly using Chi-Square test. Researcher believes that responses received by employees whom with experience more than 10 years can highly influence on the output of the study based on judgmental sampling method. Data analysis, reliability analysis, demographic factor analysis, descriptive statistical analysis, cross tabulation analysis, and correlation analysis. Chi-square testing and multiple regression analyses were used. With the expertise point of view, this study would lead to understand the factors influence on CIM. After clear analysis, the study concluded four factors namely, demand and supply of containers, high shipping rates, imports and exports trends and cargo seasonality have an influence on the container inventory management. It's acceptable that no party can completely avoid such consequences, but the researcher believes that with proper identification and planning accordingly, this ineffectiveness of container inventory management can be lessened or controlled. With no doubt, taking proactive measures will positively impact on container industry of Sri Lanka as well as the economy of the country.

Keywords: Container Inventory Management [CIM], Demand and supply imbalance, Efficiency

A Study on the Potential Barriers and Challenges for the Usage of Active Transportation in Sri Lanka: A Way Forward of the Transport System in Sri Lanka

Ranawake J[#1], Siriwardena S[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1,2]

<Jithma_jithmaranawake@gmail.com>

Abstract – Active transportation includes human-powered travel like walking, cycling, and skating. While it offers various benefits for users, society, and the economy, in Sri Lanka, it's not widely recognized as a primary commuting mode for daily travelers. This study mainly focusses on identifying potential barriers and potential challenges for the usage of Active transportation in Sri Lanka and identifying the relationship of them specially focusing on Colombo district. The study is limited only into the cycling because of the availability of data. The study has a quantitative approach and its cross-sectional study. A questionnaire was distributed physically and online to daily Colombo commuters for work, education and other purposes. Using convenience sampling, 384 responses were collected. The collected data were analysed by using IBM SPSS statistical tool. Most daily travelers to Colombo are males, with females fewer due to safety concerns while cycling. The majority belong to the millennial/Gen Z generations. Their trips prioritize work, followed by leisure activities like shopping. Few come for studies. The study has found out four potential barriers and three potential challenges for the usage of active transportation. Identified barriers are Infrastructure barriers, Safety barriers, Environmental barriers and Public Perception about cycling. Identified challenges are Costs related to cycles, Air Pollution and Educational aspects. It was also identified that there are negative relationships to the usage of active transportation in Sri Lanka from above mentioned barriers and challenges. As recommendations to future studies, it is better to look on other types of Active Transportation without limiting cycling focusing on the whole Sri Lankan context as this study based only on Colombo. It will be good future research can focus on the benefits and impact of potential barriers, challenge of active transportation. This study also provides some recommendations like creating new transport policies to promote cycling in Sri Lanka.

Keywords: Active transportation, Potential barriers, Potential challenges, cycling

Cost Optimization for Transportation Using a Mathematical Model for Jay Jay Mills (Pvt) Ltd in Sri Lanka

Ranasinghe M[#1], Thathsarani A.A.T[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,
CINEC Campus, Malabe, Sri Lanka[1,2]

<maleesharanasinghe98@gmail.com>

Abstract – The article emphasizes the vital role of transportation cost for Jay Jay Mills Pvt Ltd as businesses in transportation services and manufacturing. It highlights the need for efficient transport routes based on time and cost optimization, as transportation is a key activity connecting the entire logistics and transportation sector. The article presents a concept for cost-optimization in the transportation of goods for the Fabric company. The main objective of the research is to develop a mathematical model that minimizes the transportation cost for Jay Jay Mills (JJM). The study focuses on the significance of considering transportation costs to achieve cost optimization and stresses the positive outcomes of effective planning. Utilizing a transportation model, the research aims to identify the minimum cost for transporting fabric goods from factories to warehouses and distributors. The study successfully demonstrates the effectiveness of linear programming in minimizing transportation costs compared to manual computation. The linear programming problem is solved using the Excel solver, leading to significant cost savings in the new model compared to the old model. Anticipated savings include Rs. 170,489,764 per month using 20GP containers, Rs. 219,177,670 per month using 40GP containers, and Rs. 298,362,840 per month using 45HC containers. In conclusion, the article underscores the importance of transportation cost optimization for businesses. By developing a mathematical model, utilizing linear programming and the Excel solver, and considering proper planning, companies like Jay Jay Mills can achieve substantial cost savings, improved resource allocation, and overall operational efficiency.

Keywords: Cost Optimization, Linear Programming Model, Transport Planning

Analyzing the Factors Affecting to Select a Shipping Line for Tea Exporters in Sri Lanka

Samaranayake S.M.H.C[#1] & Thathsarani A.A.T[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1,2]

<hansitharu86@gmail.com>

Abstract – The primary objective is to identify and critically analyze the factors affecting to select a Shipping line for Tea exporting companies in Sri Lanka. The study opens path to reduce the malpractices in shipping with respect to Export industry and improve shipping services, specifically in the tea exporting industry. The secondary objectives include measuring the relationship between the identified factors affecting tea exporters and selecting a shipping line and identify the concerns and satisfaction of tea exporters, and to analyze the reason for choosing each one. It supports to reduce potential hazards and improve the services offered in the sector. Amidst post-COVID repercussions, the shipping sector has suffered a notable decline, grappling with the challenge of selecting suitable shipping lines for sustaining exports. Primary data is collected to assess independent variables. Out of 300 active tea exporters registered with Sri Lanka's Tea Board, 208 respondents contributed to the analysis. The questionnaire's three sections explore interactions with selection determinants. Part B encompasses 17 key factors evaluated via Likert-scale indices, encompassing aspects such as service rate, reliability, documentation, speed, equipment quality, safety measures, and customer service. Data is processed through SPSS for a comprehensive analysis using statistical methods. To perform factor analysis, several statistical tests and measures such as descriptive statistics, Bartlett's and Kaiser-Meyer-Olkin (KMO) tests, communalities, total variance, and rotated component matrix are computed and analyzed using SPSS 29.0.0.0 software. The output is interpreted to pinpoint the most impactful factors among the 17 identified ones. The primary limitation is the dearth of prior research on shipping line selection for Sri Lankan tea exporters. Thus, sub-factors were derived from global literature and tailored to Sri Lanka's context. These factors aim to improve and elevate the service quality offered by shipping lines in the country's tea export sector.

Keywords: Tea exporters, Shipping lines, Selection criteria, Service quality

Analyzing the Impact of Sustainable Initiatives on the Performance of 3PL Warehouses in Colombo District, Sri Lanka

Samarasinghe R.J.K.R.N[#1], Dissanayake S.[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1,2]

<nirmanir97@gmail.com>

Abstract- In today's modern corporate environment, with complicated supply chains, Shippers tend to outsource the majority of their logistical activities to service providers that are part of the Third-Party Logistics (3PL) industry when the market is competitive. These efforts have captured the attention of those responsible for making decisions about issues of sustainability. This study investigates the sustainability measures that have been put into place, specifically for the 3PL functions, which are transportation, warehousing, and packaging services, as well as the impact such initiatives have had on performances. The main objectives are to identify what sustainable factors impact on 3PL warehouse performances and to identify the impact of sustainable initiatives on 3PL warehouse performances. The sample consisted with 100 individuals who are employed in warehousing organizations in Colombo including Advantis warehousing, Expo, Logicare, and John Keells Holdings. The study follows deductive approach. Moreover, a structured questionnaire has been offered to the respondents to gather primary data. The study has unveiled several significant findings regarding the relationships between the independent variables. The functions of the 3PL have a significant impact on environmental, economic, social, and operational performance, except for packaging, which did not have any significant impact on economic, operational, or social performance. Transportation also did not have any significant impact on social performance. The empirical findings indicated that there is no significant impact between the variables in terms of the performance outcome and its impact on logistics efficiency, logistics effectiveness, and competitiveness. The only exceptions were social performance, which had a significant impact on logistics efficiency and competitiveness, and operational performance, which had a significant impact on logistics efficiency, logistics effectiveness, and competitiveness. The proposed model and hypotheses that were established provide further information of 3PL industries and the findings will offer valuable insights to a wide range of stakeholders, 3PL service providers, Transport service providers, researchers, and professionals engaged in this field.

Keywords: 3PL, Environment, Freight transportation, Logistics, Sustainability

Navigating Industry 4.0: Innovations in Logistics Management and Legal Frameworks for Inclusive Growth

Ekanayaka Y[#1], Weerakkody A[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,
CINEC Campus, Malabe, Sri Lanka[1], Attorney-at-Law[2]

<apw1218@gmail.com>

Abstract – Rapid advances in Industry 4.0 have sparked seismic transformations in a variety of sectors, reshaping the dynamics of innovation, logistics, and inclusive growth. The investigation of the symbiotic relationship between logistics management innovations, Industry 4.0 breakthroughs, and the necessity of promoting inclusive growth within this dynamic setting is presented in the abstract. This study aims to explore the intricate connections among technological advancements, methods of logistics management, and the regulatory frameworks supporting equitable growth. Researchers further aim to expose the tactics used by the logistics industry to incorporate cutting-edge technologies like IoT, AI, and block chain by analyzing case studies, policy analyses, and contemporary literature. Along with improved operational effectiveness and environmental sustainability, these technologies hold out the possibility of socioeconomic inclusion. While praising these developments, study also critically discusses the obstacles to a diverse workforce participation and the possibility of job displacement they present. Through studying of the legal frameworks that govern the use of these game-changing technologies via a comprehensive lens, safeguarding data privacy, cyber security, and fair competition while navigating Industry 4.0's frontiers Based on empirical insights and interdisciplinary viewpoints, the study unveils actionable advice for stakeholders, such as companies, legislators, and industry practitioners on how to navigate the complexities of Industry 4.0 with a strong commitment to inclusive growth and equitable participation. This research plots a future course that is grounded in the coordination of business, innovation, logistics, law, and inclusive growth in an era where technical prowess impacts economies and societies.

Keywords: Industry 4.0, Inclusive growth, Technology, Logistics industry, Legal framework

The Challenges Faced by the Fast-Food Industry in Performing Last Mile Delivery Efficiency

C.S. Mapitiya[#1], De Silva C.D[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1]

<chethanamapitiya1998@gmail.com>

Abstract – The research paper examines the challenges faced by the fast-food industry in performing last-mile delivery efficiency (Colombo District), which refers to the final stage of the delivery process from the point of distribution to the customer's doorstep. The fast-food industry is under pressure to offer effective and prompt delivery services due to the rising demand for food delivery services. However, the last-mile delivery procedure is complicated and involves various obstacles such as empty running, faster delivery, high fuel prices, small scale shipments, cheaper or free delivery, high traffic congestion, difficulty finding home addresses, and cancellation of orders. The study explores these difficulties in detail, evaluates their impact on the fast-food business, and provides alternative strategies to solve them. The report offers insights into how the fast-food sector may enhance its last-mile delivery services to suit consumer needs and keep its competitive advantage. The sample consisted of 385 workers (both managerial and non-managerial) of top five fast food chains. To conduct this research, primary data will be collected, and the researcher uses the secondary data only as a supportive method. Primary data will be collected by distributing a questionnaire to the workers both managerial and non-managerial workers who are working in selected restaurants. The researcher has identified that all the considering variables are affecting the FF industry and that there is a strongly positive relationship between considered variables. Therefore, the FF industry should focus more on operational performance.

Keywords: Fast Food Industry, Last-Mile Delivery, Empty Running, Faster Delivery High Fuel Prices, Small Scale Shipments, Cheaper or Free Delivery, High Traffic Congestion, Difficulty Finding Home Addresses, Cancellation of Orders

Identify the Factors Affecting the Selection of the Best Food Ingredients Suppliers for Fast Food Restaurants in Colombo District

Sanjula M.A.C[#1], Thathsarani A.A.T[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,

CINEC Campus, Malabe, Sri Lanka[1,2]

<www.sanjushaz1999@gmail.com>

Abstract – This study focuses on the factors that fast-food restaurants in Colombo district consider when selecting their food ingredients suppliers and 28 factors were considered for that. Researcher has used deductive approach to conduct this research. The aim of this study was to inform restaurant owners, managers, and suppliers, about the factors to be considered when selecting suppliers for fast food restaurants as-well-as facilitate their decision making. The main objective of this study was to identify the factors affecting the selection of the best food ingredients suppliers for fast food restaurants in Colombo district. The secondary objective was to identify the factors that food ingredients suppliers need to improve in order to achieve high demand from fast food restaurants. The study's population consisted of fast-food restaurants in the Colombo district. But there was not enough data to find out the number of fast-food restaurants in Colombo district. Therefore, the sample size has been taken considering the total number of fast-food restaurants in Colombo district as unknown. The sampling technique was convenience sampling, and the sample size of this study was 384 considering the response distribution as 50%, confidence level as 95% and margin of error as 5%. The quantitative data were collected through both online and physical methods using a structured questionnaire and the data obtained were analysed using SPSS v.22 software with demographic data analysis, descriptive statistics, chi square test, factor analysis, regression analysis and tests of normality. According to the findings of this research, it is concluded that reputation, distribution, and productivity components should be taken into consideration when selecting the best food ingredients suppliers for fast food restaurants. Similarly, the researcher concludes that food suppliers need to improve their performance in terms of reputation, distribution, and productivity components in order to get high demand from fast food restaurants.

Keywords: Supply chain, Fast food, Supplier selection

A Study on Impact of Green Supply Chain Management Practices on the Environmental Performance of Apparel Industry in Sri Lanka

Herath H.M.P.S[#1], Gunawardana A[#2]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,
CINEC Campus, Malabe, Sri Lanka[1,2]

<pavithrasewwandi.tfc@gmail.com>

Abstract – Setting new strategies has become necessary due to increased attention to environmental concerns and a rising tendency among nations and organizations toward environmental sustainability. This study explores the impact of Green Supply Chain Management Practices on environmental performance in the Sri Lankan apparel industry. As a result, the study's objectives are to identify the impact of green supply chain management practices on environmental performance and provide recommendations for improving the environmental performance of the apparel industry. This study mainly focused on investigating the level of green supply chain management practices (GSCMP) including Internal Environment Management (IE), Eco Design (ED), Green Manufacturing (GM), Green Purchasing (GP), and Cooperation with Customers (CC). By adopting the convenience sampling technique and quantitative survey method and using a self-administered questionnaire, the study collects data from 60 employees, including managers and executives, from three leading apparel manufacturing companies located in the Western and Northwestern provinces of Sri Lanka. These findings imply that GSCMP are more likely to impact environmental performance, as evidenced by correlations and regression analyses. The study will analyze the data to identify the extent to which green supply chain management practices are implemented in the industry and provide insights into the potential benefits of green supply chain management practices for the apparel industry in Sri Lanka. Furthermore, the study's limitations are discussed, and potential areas for further research based on the study's findings are highlighted. An exploratory study can also examine the influence of GSCMP practices on **o**rganizational performance based on the other service sectors of Sri Lanka.

Keywords: Supply chain management, Green supply chain management practices, Environment performance, Sustainability, Apparel industry

An Exploratory Study on Factors affecting for Manufacturing Bottleneck with reference to Apparel Industry, Sri Lanka

Chandrasiri D. L [#1], Bandara A. M. A. S. M [#2]

Lecturer in Pharmaceutical Management and Marketing, Faculty of Health Science,

CINEC Campus, Malabe, Sri Lanka[1], Senior Lecturer, *Department of Operations Management, Faculty of*

Management, University of Peradeniya[2]

<dinethmee.chandrasiri@cinec.edu>

Abstract – Maintaining higher effecting rate is more significance in modern manufacturing plant due to the scarcity of resources and sustainable concerns. Attainment of hundred percent resource utilization is impossible due to the different constraints in production systems. Lacking proper practice in bottle neck management techniques is one of the major reasons for machine idle time which reduce the firms' resource utilization. Based on the considered case scenario, it has created a bottleneck within the cutting department while delaying issuance of cut input to machine modules within the plant. Therefore, identifying the factors affecting for creation of bottleneck at cutting department and knowledge and perception towards cut input delay of production related employees of the considered firm is more important. The research was undertaken as exploratory deductive study. The data collection has been proceeded based interviews with employees of the firm covering all the levels of production related departments and observations with reference to snowball sampling technique. Since this was exploratory unstructured questions has been used when collecting the data. It has used content analysis method to analyse the gathered data since this is qualitative research. As per the results generated of the study the miss behaviour of operational employees and inefficient methods that used to store fabric roles and for layering the gallon lace has been leads to creation of bottle neck in the cutting department of the firm.

Keywords: Bottleneck, Resource utilization, Misbehavior of operational employees, Inefficient methods

Analyzing the Factors Affecting the Selection of Suppliers of Packaging Materials for the FMCG Industry in Sri Lanka

Gamage K.G.T.A[#1], De Silva C.D[#2], Ediriweera T[#3]

Department of Logistics and Transportation, Faculty of Management and Social Sciences,
CINEC Campus, Malabe, Sri Lanka[1,2,3]

<tharushiamandi98@gmail.com>

Abstract – This explores the factors that affecting the selection of suppliers for packaging materials for the FMCG industry in Sri Lanka. It focused on large scale manufacturing companies with more than 200 employees which produce personal care items. Convenient sampling method is used. The conceptual framework was structured based on the previous studies and eight potential influencing factors are explained. This study mainly focuses on determining the influence of cost, quality, flexibility of the supplier, adoptability of the supplier, service level, catering capacity, technical competency and reliability on deciding and measure the quality of supplier and how it is impacted on the supply chain performances in the organizations. The questionnaire was developed to get primary data for each objective referring to the past studies. Secondary data sources were used to dig deeper into the research area. 84 responses were taken by using convenient sampling by distribution of the questionnaire survey and 84 usable responses were considered in the research as a result of distributing to more than 100 employees. The employees from FMCG industry manufacturing companies which produce personal care items and those who are involved in supplier selection process. The responses are collected from several levels in organizations to have a better understanding of all of factors. The responses were collected online, and the analysis was done by taking them to one database. To analyze the factors, the author has used, descriptive analysis for demonstrating data, factor analysis for explain the relationships between the multiple variables, regression analysis to relationship between dependent and independent variables and correlation analysis for to measure the strength of the linear relationship between two variables. The author has found that cost, quality, flexibility, technical competency, service level, catering capacity and reliability factors influence the quality of the suppliers in an organization. Supplier selection processes considering most critical factors, develop supplier development and management process can improve the supply chain performance in organizations.

Keywords: Supplier selection, FMCG industry, Personal care items, Quality of suppliers

4TH CINEC INTERNATIONAL RESEARCH SYMPOSIUM PROCEEDINGS (CIRS) - 2023

INDUSTRY, INNOVATION ,AND INCLUSION: THE 21ST CENTURY WAY FORWARD

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Larvicidal Effect of Three Indigenous Plant Extracts; *Garcinia quaesita, Garcinia zeylanica* and *Coleus hadiensis* on Dengue Vect or *Aedes aegypti*

G.C.A. Perera[1], J.D.A.S.M. Jayakodi[1], J.A.H. Madhumika[1], M.S. Ishara[1], H.A.K. Ranasinghe[1#], E.H. Perera[1] and M. Hettihewa[1]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe. [1]

<achinikoshilaa@gmail.com>

Abstract- Mosquito control is essential to prevent mosquito borne diseases. Synthetic insecticides are widely used to repress mosquitoes. However, it instigates problems such as insecticide resistance among mosquitoes such as developing resistance, bio-accumulation and ecosystem destabilization. Natural plant-based products are a healthy alternative to use as mosquito larvicides. Therefore, the present study was undertaken to evaluate the larvicidal efficacy of *Garcinia zeylanica*, *Garcinia quaesita* and *Coleus hadiensis* against *Aedes aegypti* mosquito larvae. Fresh leaves of plants were collected and the aqueous crude extract was prepared. Phytochemicals were extracted using refluxing technique. A concentration series of crude extract of leaves were prepared separately from 20mg/L- 100 mg/L. Batches of each containing 100 third instar larvae of *Aedes aegypti* were used for larval bioassays. *Aedes aegypti* mosquito larvae were evaluated accordance with guidelines of WHO. Probit analysis was used to evaluate the relationship of mortality with the concentration of aqueous crude extract. The *Garcinia zeylanica* and *Garcinia quaesita* leaf extracts showed a dose-dependent effect against *Aedes aegypti* larvae after 24 hours and 48 hours exposure period. Interestingly, *Coleus hadiensis* did not show any dose-dependent effect against *Aedes aegypti* mosquito larvae. The percentage mortality rates have shown a significant variance among different concentrations ($P = 0.000$). The recorded LC_{50} and LC_{90} for aqueous crude extract of *Garcinia zeylanica* were 27.167g/L and 52.861g/L respectively and LC_{50} and LC_{90} for aqueous crude extract of *Garcinia quaesita* were 36.841g/L and 76.036g/L respectively, after 24 hours of exposure period. The *Garcinia zeylanica* and *Garcinia quaesita* plant's high larvicidal activity is supported by the presence of phytochemicals such as saponins, steroids, flavonoids and phenol which showed combination effects in terms of larvicidal action to mosquito larvae. Hence, there is a potential of *Garcinia zeylanica*, and *Garcinia quaesita* aqueous leaf extracts as a key source for the development of an environment-friendly plant based larvicide against *Aedes aegypti*.

Keywords: bioassay, exposure, phytochemical, potential

Development of Topical Antimicrobial Formulation Using *Mangifera zeylanica* Leaf Extract

O.P.C. *Deshan*[1], S.M.R.N. *Senarathne*[1], S.N. *Warnakulasuriya*[2] and S.L.A. *Gunawardana*[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences,
CINEC Campus, Malabe, Sri Lanka[1]
Industrial Technology Institute, Colombo, Sri Lanka[2]
<shehara.gunawardana@cinec.edu>

Abstract – The development of novel antimicrobial dosage forms has become a major focus of current pharmaceutical research due to the growing concerns about multidrug-resistant bacterial, viral, and fungal strains. Based on our previous investigation which demonstrated the antimicrobial activity of ethyl acetate and ethanolic leaf extracts of *Mangifera zeylanica* against five different microorganisms, the present study focused on developing an antimicrobial formulation using the functionally active phytochemicals present in the *Mangifera zeylanica* leaves. A topical cream formulation was developed incorporating emulsifying wax, stearic acid, Tween 80, virgin coconut oil, distilled water, glycerine, phenoxyethanol, and fragrance in combination with the ethanolic leaf extract of *Mangifera zeylanica*. The developed cream was evaluated for its antimicrobial activity, organoleptic properties, spreadability, viscosity, and pH value. The highest zone of inhibition (17.5 ± 0.50 mm) was reported by *Candida albicans* while the lowest zone of inhibition (10.5 ± 0.70 mm) was exhibited by *Staphylococcus epidermidis*. Phase separation of the topical formulation was not detected after centrifuging at 4000 rpm for five minutes or keeping in the hot air oven at 45 ºC for one week. The developed formulation was observed to be opaque, brown-green in colour, and have a smooth and homogeneous texture. The spreadability, viscosity, and pH value of the formulation resulted in 10.17 g.cm/s, 675800 cP, and 5.81 ± 0.12, respectively. The study concludes that a stable cream formulation with a therapeutic potential of treating microbial infections can be developed using ethanolic leaf extract of *M. zeylanica*.

Keywords: *Mangifera zeylanica* leaves, Antimicrobial activity, Ethanolic leaf extract, Topical cream formulation

In vitro Evaluation of Anti-inflammatory Activity of the Leaves of *Neolitsea cassia* (L) (Dawul kurudu)

M.M.P.M. Hasanthi[1], S.A.S.D. Senanayake[1], S.K. Hettihewa[2] and P.M. Kumarapperuma[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences,
CINEC Campus, Malabe, Sri Lanka[1]
Department of Pharmacy, Faculty of Allied Health Sciences,
University of Ruhuna, Sri Lanka[2]
<Pavithra.Kumarapperuma@cinec.edu>

Abstract: Various non-steroidal anti-inflammatory drugs (NSAIDs) with many known side effects have been used to lower pain and inflammation by blocking the activity of inflammatory mediators. However, scientists have researched to investigate medicinal plants to develop novel formulations with low or no side effects to treat inflammation. Therefore, this study was conducted to evaluate the *in-vitro* anti-inflammatory activity of *Neolitsea cassia* (Dawul kurudu) plant which is endemic to Sri Lanka. The crude extract was obtained by using maceration while using 70% acetone as the solvent and concentrated by rotary evaporation. Then the crude extract was freeze dried for further analysis and the extract was subjected to qualitative phytochemical analysis. The *in vitro* anti-inflammatory activity was evaluated using the Human Red Blood Cell (HRBC) membrane stabilization method. The hemoglobin released throughout the damaged erythrocyte membrane was then quantified at the wavelength of 56 0 nm. The qualitative phytochemical analysis findings revealed alkaloids, flavonoids, saponins, and phenols present in the extract. At a concentration of 2000 µg/mL, the 70% acetone extract exhibited the highest percentage inhibition of heat-induced hemolysis at 70.38%, surpassing the observed 61.14% inhibition demonstrated by aspirin at the same concentration. Further, the obtained results indicated that the 70% acetone extract exhibited an IC50 value of 1514 µg/mL, while the standard, aspirin, demonstrated an IC50 value of 374.7 µg/mL, highlighting the comparative potency of the tested extract. Therefore, it is concluded that *N. cassia* has promising anti-inflammatory activity and is recommended for further investigations on the compounds that give the anti-inflammatory activity and the development of novel formulations by using the plant.

Keywords: Anti-inflammatory*,* HRBC membrane stabilization*, Neolitsea cassia*

Evaluation of the Phytochemical Activity of *Mangifera zeylanica* Bark

W.M.A.D.M. Ruwanthika[1], A.M.Dissanayake[1], D. Sathyangani[1], W.D.U.S. Fernando[1] and S.L.A. Gunawardana[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences,
CINEC Campus, Malabe, Sri Lanka[1]
<shehara.gunawardana@cinec.edu>

Abstract - *Mangifera zeylanica* is an endemic plant in Sri Lanka that has been traditionally used to cure various diseases. Phytochemicals present in the different plant parts play a significant role in their pharmacological activity. The present study investigated the different bioactive chemical compounds that are presented in the inner and outer bark of *Mangifera zeylanica* extracted into aqueous and methanol extract. The air-dried inner and outer bark of *Mangifera zeylanica* was extracted into the methanol and aqueous solvents by using the refluxing method and obtained four extracts: methanol inner bark (MIB), methanol outer bark (MOB), aqueous inner bark (AIB) and aqueous outer bark (AOB). Qualitative phytochemicals screening of alkaloids, phenols, tannins, terpenoids, proteins, saponins, cardiac glycosides, carbohydrates, and steroids were carried out in all four extracts using the Salkowski, Liberman-Burchard's, Mayer's, Wagner's, Biuret, Keller Killiani's, Kedde's test, Molisch and Benedict's assays. The study demonstrated that all four extracts contain phenols and tannins while none was tested positive for carbohydrates. All the extracts except MOB tested positive for alkaloids. The MIB and MOB also tested positive for proteins, cardiac glycosides, and steroids. Out of the four extracts only the AIB tested positive for terpenoids. The study concludes that MIB and MOB contain a higher content of phytochemicals when compared with the aqueous extracts of inner and outer bark. Thus, the bark extracts have the potential to be used to determine the therapeutic potential.

Keywords: Inner bark, *Mangifera zeylanica-,* Outer bark-, Phytochemical

Antibacterial Efficacy and Phytochemical Properties of the Bark Extract of *Connarus monocarpus* (Fam: Connaraceae)

A.M.M.T Bandara Aththanayaka[#1], B.G.L.K Beddewela[1], R.H.M.L.D Bandara[1], K.N Nawanjana[1], K.M.S.S Jayathunga[1], M.I.B Aadhila[1], M.A.D Pushpakumara[1], HAK Ranasinghe[1] and E.H.L Perera[1].

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka.[1]
<melanaththanayaka.official@gmail.com >

Abstract – The Connaraceae family encompasses various plant species known for their antimicrobial properties found in their bark, leaves, and roots. Therefore, the present study was conducted to investigate the antimicrobial properties of *Connarus monocarpus* (L) a member of the Connaraceae family found in Sri Lanka which is traditionally used for therapeutic wound healing. The active phytochemicals were extracted from the barks, using the reflux method employed in an aqueous medium. The antimicrobial properties of plant extract were assessed using the disk (well) diffusion agar method against four common pathogens; *Staphylococcus aureus, Pseudomonas aeruginosa, Proteus mirabilis* and *Enterococcus*. Controls were run with double distilled water. All procedures were performed in accordance with aseptic methods. The diameter of inhibition zones was observed after the incubation period and statistical analysis was performed using SPSS software package. The independent t-test revealed a significant difference between the mean values of the control and Bark extraction for *Staphylococcus aureus* (p=0.001), *Pseudomonas aeruginosa* (p=0.001), *Proteus mirabilis* (p=0.001), *Enterococcus* (p=0.001); revealing the antibacterial activity of the plant extract. Additionally, there was a statistically significant difference in antimicrobial activity among the four microbes according to the One-Way ANOVA test (p = 0.0001). The *Connarus monocarpus* plant's antibacterial activity is supported by the presence of phytochemicals such as alkaloids, steroids, flavonoids, phenol and tannins which showed combination effects. The present findings highlight the potential of *Connarus monocarpus* bark extract as a valuable source of antimicrobial agents, warranting further investigation to elucidate its specific mechanisms of action and potential applications in the field of microbial control.

Keywords: *Escherichia,* control, disk-diffusion, microbial, phytochemical.

Exploring the Antibacterial Activity of Leaf, Stem, and Root Extracts of

Exallage auricularia (Gatekola/Eared-Leaf Diamond Flower)

K.N.M. Wickramaratne[#1], B.S.W.M.T.B. Dayananda[1], K.A.D. Krishantha[1], R.M.C.R. Rajapakshe[1], G.T.R. Silva[1], M.C. Ransarani[1], N.K. Gamage[1], H.A.K. Ranasinghe[1] and E.H.L. Perera[1].

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<wickramaratne.knm@gmail.com>

Abstract- The Rubiaceae family encompasses a diverse array of plant species renowned for their inherent antimicrobial attributes found in their leaves, stems, and roots. Therefore, the present study aims to investigate the antimicrobial efficacy of *Exallage auricularia* (Gatekola); which is used as a remedy for healing wounds. The active phytochemicals were extracted from the plant parts by using the reflux method in aqueous medium. The antibacterial efficacy of the plant extracts were assessed against four pathogenic bacteria, *Pseudomonas aeruginosa, Proteus mirabilis, Klebsiella pneumoniae,* and *Staphylococcus aureus* by employing the disk (well) diffusion agar technique. Control groups underwent treatment with double-distilled water. All procedures were strictly adhered to aseptic protocols. The diameters of the inhibition zones were measured, following a 24-hour incubation period. The statistical analysis was conducted using SPSS software package. The independent t-test unveiled a significant difference in mean values between the control group and the root extraction concerning *Pseudomonas aeruginosa* (p=0.003), and *Klebsiella pneumoniae* (p=0.028) as well as between the control group and the stem extraction for *Pseudomonas aeruginosa* (p=0.012), and between the control group and the leaf extraction for *Pseudomonas aeruginosa* (p=0.035), *Proteus mirabilis* (p=0.001), and *Klebsiella pneumoniae* (p=0.012). Furthermore, there was no significant difference in antibacterial activity between the extracts of three plant parts against *Pseudomonas aeruginosa* (One Way ANOVA; p=0.158). The present outcomes accentuate the evident antibacterial capabilities of the plant extracts. Phytochemical analysis, revealed the presence of steroids, phenols, and tannins as common in leaf and stem extracts, but the leaf extract contained flavonoids and alkaloids additionally. The current findings revealed the potential of the *Exallage auricularia* plant as a valuable reservoir of antimicrobial agents and potential applications within the field of microbial control is recommended.

Keywords: Antimicrobial, *Pseudomonas*, Rubiaceae, Phytochemical, Woun

Formulation and Stability Evaluation of Emulsions Containing *Callophyllum inophyllum* Seed Oil to Develop as a Sunscreen/s

A.H.D.P. Premachandra[1], N.S. Silva[1], N.A. Sanjeewani[2], and H.H.V.K.N. De Silva[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka [1],
Department of Pharmacy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Werahera, Sri Lanka [2]
<Vishwa.DeSilva@cinec.edu>

Abstract – Exposure to ultraviolet radiation is a major contributing factor to the increasing number of skin cancers. Interest has grown in using plant extracts as natural sun protective ingredients in pharmaceutical formulations due to their photoprotective, and antioxidant effects. This study aimed to formulate, and physical stability evaluation of emulsions containing *Callophyllum inophyllum* seed oil to develop as a sunscreen/s. Initially five different primary emulsions were prepared according to randomly selected ratios using commercially available *Calophyllum inophyllum* seed oil: distilled water: Tween 20 / Tween 80 emulsifying agent in 28.57: 47.61: 23.80, 26.19: 52.38: 21.42, 23.80: 42.85: 33.33, 33.33: 38.09: 28.57 and 28.57: 38.09: 33.33. Primary emulsions were prepared from each emulsifying agent using magnetic stirrer at 600 rpm for 12 minutes. Those were subjected to short-term stability evaluation for 14 days and stable emulsions were subjected to high shear homogenization at 5000 rpm for 05 minutes to obtain secondary emulsions. All prepared primary and secondary emulsions were subjected to centrifugation at 5000 rpm for 05 minutes. Then emulsions were kept for evaluation of short-term (14 days), long-term (60 days) and centrifugation (28 days) stability at room temperature (28±5ºC). Three primary emulsions were stable throughout the short-term stability evaluation period. But only two primary emulsions with their respective secondary emulsions consisting of Tween 20 and Tween 80 respectively in the same ratio were stable throughout the long-term stability evaluation period. Those two primary emulsions after centrifugation were stable for 14 days, while their respective secondary emulsions were stable for 24 days after centrifugation. In conclusion, 23.80% *Callophyllum inophyllum* seed oil, 42.85% of distilled water, and 33.33% emulsifying agent consisting of secondary emulsions from each emulsifying agent were considered as the most physically stable emulsions to develop as a sunscreen/s.

Keywords: Stability evaluation, *Callophyllum inophyllum* seed oil, Tween 20®, Tween 80®

Sun Protection Formulation from *Pyrrosia heterophylla* and *Pyrrosia lanceolate* Leaves

G.A.J Rathnasekara[1], S.M.A.K. Siriwardhana[1] and S.L.A. Gunawardana[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences,CINEC Campus, Malabe, Sri Lanka[1]
<shehara.gunawardana@cinec.edu>

Abstract- The allergic and carcinogenic potential of synthetic compounds used in sunscreen formulations have drawn the attention of developing sunscreens from natural products in recent years. *Pyrrosia* species, which has shown antioxidant and anti-inflammatory properties has not been investigated for its sun protection activity. Thus, the present study aims to evaluate the sun protection activity of *Pyrrosia heterophylla* and *Pyrrosia lanceolata* species and to develop a sunscreen formulation from the most active extract. Air-dried leaves of *P. heterophylla* and *P. lanceolata* were sequentially extracted using hexane, ethyl acetate, and ethanol respectively. The Sun Protection Factor (SPF) and Lethal Concentration 50 (LC_{50}) values of the extracts were determined from measuring the absorbance of the solution from the extract using a UV spectrophotometer a wavelength of 290 nm-320 nm and brine shrimp assay respectively. The plant extract with the highest SPF and LC_{50} was selected for the development of formulations using water, castor oil, tween 80, beeswax, stearic acid, and shea butter as excipients. The formulation was evaluated for sun protection activity, stability, quality, and visual attributes of the formulation. The ethanolic extract, which resulted in the highest yield percentage (67%), was used to determine the SPF value. Preliminary investigation of the SPF and LC_{50} values showed that *P. heterophylla* demonstrated the highest LC_{50} value and SPF value of 2.677 mg/mL and 28.59 ± 0.2 respectively. Hence, formulations containing the ethanolic extract in the concentrations of 2.5 mg/mL, 1.25 mg/mL and 0.625 mg/mL were developed. The SPF values of those formulations were 28.59 ± 0.2, 26.40 ± 1.0, 23.60 ± 1.0 respectively. The formulation was stable during the observed 28 days with no phase separation in all storage conditions. The pH of the formulation was suitable for topical formulation. The spreadability and viscosity were 9.334 and 36150 cP. Hence, the present study concludes that *P. heterophylla* exhibited potent sun protection activity compared to *P. lanceolata*. Developed secondary formulations showed SPF values greater than 15, indicating the potential of using these plant species as natural and effective ingredients in sunscreen formulations.

Keywords: *Pyrrosia heterophylla*, *Pyrrosia lanceolata*, Sun protection factor

Formulation, Stability Evaluation and Analysis of *Centella asiatica* Based Anti-ageing Face Serum

V.D. Ranathunga[1], M.P. Wanasinghe[2], D.P. Handugala[2], S.M. Kodikara[1] and H.H.V.K.N. De Silva[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[1],
Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[2]
<Vishwa.DeSilva@cinec.edu>

Abstract - Extrinsic skin damaging factors attack healthy tissues by triggering "skin ageing". Thus, antioxidants have the potency of scavenging free radicals and reduce skin ageing. Since natural products are in demand because of their less side effects compared to synthetic medicines, leaves of *Centella asiatica* which have scientifically proven with prominent *in vitro* antioxidant activity was considered in this study to formulate emulsion-based serum. The objective of this study was to formulate, stability evaluate and analysis of *C. asiatica* based anti-ageing face serum. The *C. asiatica* ethanol: water (9:1) leaves extract was obtained by reflux condensing at 45 $^\circ$C. Seven different serum bases were formulated by addition of olive oil, stingless bee honey, Tween 80, glycerin, Sodium Benzoate and orange fragrance as the main excipients. The physical stability was evaluated throughout 365 days at different temperatures (8 ºC, 28 ±5 ºC and 40 $^\circ$C). Then 0.5% leaves extract was incorporated into the stable serum base and evaluated the *in vitro* antioxidant activity by 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. Gallic acid was used as the positive control. The physical stability and physical and chemical properties including colour, odor, texture and pH were evaluated for the prepared face serum. The *in vitro* lethal toxicity assay was conducted for the leaves extract at the concentration that showed antioxidant activity. The 82.086% of DPPH scavenging activity shown by the added percentage of leaves extract to the face serum compared to the gallic acid (IC_{50} 0.004 mg/mL) with non-toxic nature to brine shrimps. The prepared face serum was physically stable to date. It was cream-brown with a smooth texture and pleasant odour with pH 5.1. The stable face serum complies with acceptable antioxidant activity, physical and chemical properties will be recommended for further characterization to commercialize as an anti-ageing face serum.

Key words – Anti-ageing, Antioxidants, *Centella asiatica,* Face serum

Evaluating the Labels on Skincare Cosmetic Products in Sri Lanka

R.A.M.D. Ranawaka[1], J.M.V.R.J. Bandara[1], M.A.C Madushani[1], P.M.N. Weerasinghe[1], M.D.P.N. Wickramarathne[1] and W.M.K.M. Ratnayake[#1]

Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<kalpani.ratnayake@cinec.edu>

Abstract-Cosmetic products play a crucial role in maintaining personal hygiene including skin care and skin protection, while they are useful in enhancing personal beauty. Hence, selection of the best cosmetic product is very important and cosmetic labels act as one of the main reasons for customers to buy those products. Therefore, a cosmetic label should be designed in an easily comprehensible manner and allow access to customers the necessary information. Because of the importance of cosmetic products' labels, the present study aimed to evaluate the information present on skincare cosmetic products in Sri Lanka. Data collection was carried out from July to mid-August 2023 from one hundred skincare cosmetic products including cleansers, facial scrubs, body lotions, face wash, body wash, face masks, night creams, day creams, sun scream and lotions, anti-ageing creams, underarm cream and fairness cream. For each product, product name, brand name, manufacturer details, country, manufactured and expiration dates, shelf life, volume or weight, price, directions, contact information, skin types, pH value, SPF value in sun protection products, ingredients, storage conditions, precaution details in three details and presence of symbols were recorded. Data were analyzed using Microsoft Excel Among the analyzed products, all products contained details of product name, brand name, manufacture and expiration date, and price. 34% of products mentioned skin type. Among the analyzed labels, 98% showed an ingredient list, and 79.59% of them separately mentioned the main active ingredient. Only 26% of products' labels included storage conditions. Although 57% of products' label contains special precautions such as external use only, if irritation develops stop use and consult with a doctor, only 43.85% of products contained those in three languages. 49% contained precautions only in English. Further, 77% of products' labels contained different types of claims. According to the analysis, it was found that some important details are missing on cosmetic labels. Hence, it is recommended to further improve the label on skincare cosmetic products in Sri Lanka.

Keywords: Cosmetic product, label, skincare

Evaluation of Knowledge, Attitudes and Practices on Facial Skincare Routines in Undergraduates of Universities and Higher Educational Institutes in Western Province, Sri Lanka

H.P.U.V. Jayathilake[1], H.M.L.S. Nikathenna[1], H.A.T. Dharmapriya[1], P.K. Wanniarachchi[1], H.M.D.P. Handugala[1], S.S. Amarasingha[1], W.A.D.M.P. Wanasinghe[1] and W.M.K.M. Ratnayake[#1]

Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka[1]

<kalpani.ratnayake@cinec.edu>

Abstract- Skincare is the process which helps to maintain the skin's structural and functional integrity. Insufficient knowledge and practices in skin care can cause numerous problems associated with dermatological conditions. Hence, following proper skincare routines are essential to maintain healthy skin. This study aimed to evaluate knowledge, attitudes and practices on facial skincare routines in undergraduates in universities and higher educational institutes in Western Province, Sri Lanka. A descriptive cross-sectional study was performed among undergraduates aged 18-30 in the Western province using a structured questionnaire (N= 216). The ethical clearance was obtained from the Ethics Review Committee, CINEC Campus. The data was analyzed by SPSS software. There were 123 undergraduates from state universities and 93 from non-state Higher Educational Institutes. Among the participants, 20.8 % were male, and the remaining 79.2% were female. The study showed that among the factors that undergraduates are considering when they purchase facial skincare products, ingredients (74.07%) and skincare benefits (71.76%) are the major ones. Most undergraduates (92.13%) prefer cosmetic products with natural ingredients and only (7.87%) prefer synthetic ones. Among the study reasons for using skin care products, the majority mentioned improving skin health (77.31%). Also, 68.52% of undergraduates select facial skincare products according to their skin type. However, 25.92% are sometimes select facial skincare products according to their skin type, and 5.09% are never depend on that. The results showed that some undergraduates are still unaware of the accurate information regarding skincare routines, some require further knowledge.

Keywords – cosmetic, facial, skincare

Formulation and Development of Skincare Cream Containing *Pleurotus djamor*

K.A.E. Madushanka[1], W.V.P.M. Weligalla[1], K.D.K.P. Kumari[2] and W.M.K.M. Ratnayake[3#]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Sri Lanka[1]
Department of Basic Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka[2]
Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka[3]
<kalpani.ratnayake@cinec.edu>

Antioxidants help to protect the skin against free radical damage. The incorporation of antioxidants creates a high demand for skincare cream. The previous studies showed that the aqueous extract of *Pleurotus djamor* contains significant antioxidant potential. Hence, the present study aimed to develop a stable skincare cream formulation containing aqueous extract of *P. djamor*. A series of cream formulations were prepared using an aqueous extract of *P. djamor*, emulsifying wax, shea butter, stearic acid, rose oil, methylparaben and Tween 20 according to three randomly selected ratios. The amount taken from *P. djamor*, emulsifying wax, and shea butter was changed in each formulation while keeping other excipients constant. Short-term stability tests for prepared cream formulations were carried out by storing cream preparations for 14 days at various storage temperature conditions 4 ºC, 28 ºC and 40 ºC. Long-term stability was evaluated for 90 days. Further, to evaluate centrifugation stability, formulations were centrifuged at 4000 rpm for 5 minutes and kept for 28 days in storage conditions at various temperatures 4 ºC, 28 ºC and 40 ºC. The antioxidant activity of stable cream formulation was evaluated by 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. The formulation that contains 36.3 % of aqueous extract of P. *djamor* showed the highest stability with a pH value of 5.9. The stable formulation exhibited significant ($p < 0.05$) dose-dependent DPPH scavenging activity with an IC50 value of 1.5 mg/mL, whereas, 12.92 µg /mL for standardbred inhibitor ascorbic acid. In conclusion, the present findings provided scientific evidence for developing a stable cream formulation incorporating aqueous extract of *P. djamor*, with antioxidant properties.

Keywords: antioxidant, *Pleurotus djamor,* skincare cream

Evaluation of Antioxidant and Antidiabetic Activities of *Horsfieldia iryaghedhi* of Sri Lanka

P.A. Mendis[1], Y.D. Weerakondaarachchi[1], H.H.V.K.N. De Silva[1] and P.M. Kumarapperuma[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[1]

<*Pavithra.Kumarapperuma@cinec.edu*>

Abstract – Oxidative stress plays a major role in the pathogenesis of metabolic syndrome including diabetes mellitus (DM). The inhibition of α-amylase is an important therapeutic target in the regulation of postprandial high blood glucose levels in diabetes patients. This research study was conducted to investigate the phytochemicals, antioxidant activity, and α-amylase inhibitory activity of the methanolic and aqueous leaves extracts of *Horsfieldia iryaghedhi*. Crude methanolic leaves extract was obtained by refluxing under 60°C and dried by rotary evaporation. Aqueous leaves extraction was subjected to refluxing under 80°C and freeze-dried to obtain the crude. Both plant extracts of *Horsfieldia iryaghedhi* were subjected to qualitative screening of phytochemicals such as, saponins by froth test, flavonoids by cyanidine test, alkaloids by Wagner's and Mayer's tests, tannins by gelatine test, phenols by ferric chloride test and unsaturated sterols by Salkowski test. *In vitro* antioxidant activity was evaluated by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay and *in vitro* α-amylase inhibitory assay was conducted to evaluate antidiabetic activity. As results, The DPPH assay showed that the methanolic leaves extract with IC_{50} 1409 µg/mL, followed by aqueous leaves extract with IC_{50} 1021 µg/mL. The standard inhibitor ascorbic acid showed IC_{50} at 690.6 µg/mL. The α-amylase enzyme inhibitory assay results showed IC_{50} 936.7 µg/mL for methanolic leaves extract, followed by IC_{50} 802.9 µg/mL for aqueous leaves extract. The standard inhibitor acarbose showed IC_{50} at 544.8 µg/mL. In conclusion, the aqueous leaves extract showed the highest antioxidant and antidiabetic activities than the methanolic leaves extracts. This study supports the Ayurveda concept that *Horsfieldia iryaghedhi* could be useful in management of DM.

Keywords: Antioxidant, antidiabetic, *Horsfieldia iryaghedhi*

In-vitro investigation of tyrosinase inhibition, antioxidant activity and lethal toxicity of *Mimosa pudica* and *Glycyrrhiza glabra* plant extracts

TDB Kangara[1], NWAN Maanisha[1], DBM Wickramaratne[2], and HHVKN De Silva[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences,
CINEC Campus, Malabe, Sri Lanka[1],
Department of Pharmacy, Faculty of Allied Health Sciences,
University of Peradeniya, Sri Lanka[2]

<Vishwa.DeSilva@cinec.edu >

Abstract- Tyrosinase is a key enzyme involved in the biosynthesis of melanin. Since reactive oxygen species promote melanogenesis, effective antioxidants are highly concerned with normalizing melanin production. Therefore, this study was aimed at investigating the *in-vitro* tyrosinase inhibition activity, antioxidant activity, and lethal toxicity of the extracts obtained from the plants, *Mimosa pudica* and *Glycyrrhiza glabra* with the aim of developing a topical formulation to treat hyperpigmentation. The *G. glabra* roots extract was obtained by reflux condensing at 60°C with ethanol and *M. pudica* leaves and pods extracts were obtained by reflux condensing at 50°C with methanol. The mushroom tyrosinase inhibition and 2, 2-diphenyl-1-picrylhydrazyl assays were conducted in triplicates to evaluate tyrosinase inhibition and antioxidant activities of the plant extracts respectively. *M. pudica* leaves extract, *M. pudica* pods extract, and *G. glabra* roots extract were subjected to tyrosinase inhibition assay as a single mixture containing 1:1:2 ratio. Lethal toxicity assay was conducted using brine shrimps. The mixture of all three plant extracts showed mushroom tyrosinase inhibition activity at IC_{50} 47.47 $\pm$ 0.42 µg/mL compared to the standard inhibitor kojic acid at 76.61 $\pm$ 0.80 µg/mL. The *M. pudica* leaves extract showed antioxidant activity at IC_{50} 34.26 µg/mL followed by *M. pudica* pods extract at, IC_{50} 75.09 µg/mL and *G. glabra* roots extract at IC_{50} 95.82 µg/mL compared to the standard inhibitor ascorbic acid at IC_{50} 11.56 µg/mL. All three plant extracts were non-toxic to brine shrimps at the concentrations that showed tyrosinase inhibition and antioxidant activities. All three plant extracts exhibited effective tyrosinase inhibition and antioxidant activities at the concentrations below 100 µg/mL. where *M. pudica* leaves extract showed prominent antioxidant activity. A combination of all three plant extracts should be considered as a potential source for the development of a poly-herbal topical formulation to treat hyperpigmentation.

Keywords: Antioxidants, *Glycyrrhiza glabra,* Hyperpigmentation, *Mimosa pudica,* Tyrosinase inhibition

In-vitro Investigation of Antioxidant Activity and Phytochemical Screening of the *Diospyros* Species in Sri Lanka

N.T. Thotawatte[1], K.V.P.M. Bandara[1], R.G.W.D.B. Rajapaksha[2], and H.H.V.K.N. De Silva[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka[1]
Department of Pharmacy, Faculty of Health Sciences, The Open University, Nawala, Nugegoda, Sri Lanka[2]

<Vishwa.DeSilva@cinec.edu>

Abstract – Free radicals inevitably generated within biological systems can cause various degenerative disorders. They must be scavenged with the aid of antioxidants to avoid complications. Antioxidants are used as efficient excipients that inhibit the oxidation of molecules and help maintain the expected effectiveness and stability of pharmaceutical formulations. Thus, this study was conducted to investigate the *in-vitro* antioxidant activity in *Diospyros* sp. and to evaluate the presence of phytochemicals qualitatively and quantitatively. The ethanolic and ethyl acetate leaves extracts of *Diospyros* sp. were obtained via maceration at 40ºC and the extracts were subjected to 2, 2-diphenyl-1-picrylhydrazyl (DPPH) assay. Three replicates at each concentration of both extracts were used to perform the DPPH assay. The qualitative phytochemical screening was performed for each leaves extract and Total Phenolic Content (TPC) was quantitatively determined by the Folin-Ciocalteu reagent method. Phytochemical screening results displayed the presence of phenols in both extracts but other phytochemicals were not exactly justified by the above analysis. The ethanolic and ethyl acetate leaves extracts showed antioxidant activity at IC_{50} 0.00255 mg/ml and IC_{50} 0.001679 mg/ml respectively compared to the positive standard ascorbic acid which showed antioxidant activity at IC_{50} 0.000624 mg/ml. The TPC of the ethanolic leaves extract was found to be 2.273×10^{-4} mg GAE/g, and in the ethyl acetate leaf extract, it was found to be 8.296×10^{-3} mg GAE/g. It was concluded that both the extracts showed less potency against DPPH radical compared to the positive standard ascorbic acid but the potency of the ethyl acetate leaves extract is higher than that of the ethanolic leaves extract. Much of the discovered antioxidant property was expected to be from phenols extracted into both chosen solvents. Further, it is recommended to expand this study to isolate and identify the compounds providing antioxidant properties.

Keywords: Antioxidants, *Diospyros* sp., Phenols, Total Phenolic Content

Antioxidant Activity of Selected Edible Mushrooms in Sri Lanka

K.H.E. Fernando[1], G.S.D. Nawaruwan[1], H.D. Dedigama[1], E.J. Siriwardene[1], A.H.M.A.N. Abeysinghe[1], , K.D.K.P. Kumari[2] and W.M.K.M. Ratnayake[3#]

Department of Biomedical Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka[1],

Department of Basic Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka[2],

Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka[3]

<kalpani.ratnayake@cinec.edu>

Abstract- Mushrooms are a valuable source of proteins, vitamins as well as antioxidants. Hence, higher mushroom consumption can lower the risk of certain diseases. However, up to date published scientific information on the antioxidant potential of some edible mushrooms is still being determined. Hence, this study evaluated and compared the antioxidant potential of some of the three commonly used mushroom varieties in Sri Lanka such as *Agaricus bisporus* (Button mushroom), *Pleurotus ostreatus* (American oyster), and *Pleurotus cystidiosus* (Abalone mushroom). The antioxidant activity of aqueous extracts of the above three mushrooms was evaluated by using a 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. Ascorbic acid (1.25 µg/mL-20 µg/mL) was used as a positive control. The radical scavenging activity of test samples was expressed as half maximal inhibitory concentration (IC_{50}), which is defined as the mean concentration of the antioxidant required to lower the initial DPPH concentration by 50% in each experiment. It was determined by using the graph plotted with the mean concentration of triplicates of each test sample vs percentage radical scavenging activity. The data were analyzed by using SPSS software package and the p-value < 0.05 was considered statistically significant. The findings of the present study revealed that all the test doses of each mushroom significantly ($p < 0.05$) inhibit DPPH free radicals in a dose-dependent manner, compared to the negative control. The IC_{50} values were 28.28 mg/mL, 50.38 mg/mL and 78.55 mg/mL for *A. bisporus*, *P. ostreatus* and *P.cystidiosus*, respectively. Ascorbic acid, which was the positive control, showed 10.16 µg/mL for the IC_{50}. Hence, *A. bisporus* was identified as the most active type with antioxidant potential among the three tested mushroom types in the study. This provides scientific support for the medicinal validity of selected mushrooms grown in Sri Lanka and will enhance consumers' preference to add mushrooms to their daily diet.

Keywords: *Agaricus bisporus*, Antioxidant, *Pleurotus ostreatus, Pleurotus cystidiosus*

Preliminary Study on Consumption of Vitamin Supplements by General Public in Colombo District

W.A.P. Hashini[1], M.E. Galabada[1], W.J.D.D. Jayathunga[1], A.H.M.H. Bandaramanike[1], M.A.C. Madhushani[2], K.G.C. Sankalpani[1] and W.M.K.M. Ratnayake[2#]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Sri Lanka[1]

Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka[2]

⟨*kalpani.ratnayake@cinec.edu*⟩

Abstract- Vitamins are considered essential nutrients because acting in concert, they perform hundreds of roles in the body. However, many people use multivitamin dosage forms as they want, without any medical advice. It can have some effects. Hence, this study aimed to investigate knowledge, attitudes, and practices regarding the consumption of vitamin supplements by the general public in the Colombo district. A descriptive cross-sectional survey was performed among the general public in the Colombo district (N= 128) using a structured questionnaire. The ethics clearance was obtained from the Ethics Review Committee, CINEC Campus. Among the 88% of participants who believe vitamins are essential for our health, 48% think that the daily recommended amount of vitamin can only be from our foods. Among the participants, 73 % have taken any vitamin supplement in the past and the rest of the 27 % have not. Out of that 73%, the majority belonged to the 20-35 age group. Most of the participants (63%) are using multivitamins and mineral pills according to the medical advice. Among the participants who are multivitamin and mineral pills, they use them because of a recommendation by a parent, coach or friend (13 %), to improve diet (20%), to specific dietary needs (5 %), to weight loss or weight gain (2 %), to enhance the immune system (5%) and to enhance overall performance in day-to-day life (7 %). None of them took multivitamins and mineral pills to enjoy the taste but 7% of participants took vitamin C to enjoy the taste. Further, among the participants, 84% believe that vitamin supplements can change their body health positively. Also, 83% of participants believe that long-term consumption of multivitamins can cause toxic effects. As the results showed, although people are consuming multivitamins, they do not possess enough awareness about the consumption. Hence, it is concluded that some of them require further knowledge on the above.

Keywords: minerals, multivitamin, supplements

Formulation Development and Analysis of Poly-herbal Antidiabetic Syrup

H.H.V.K.N. De Silva[1,2], L.C.P.T. Liyanaarachchie[#2], and D.B.M. Wickramaratne[2]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Sri Lanka[1],
Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka[2]

<chamilaliya@ahs.pdn.ac.lk>

Abstract – Diabetes mellitus is a major health concern in the world as it reduces the quality of life. Due to the adverse effects of allopathic medicines, plant-based medicines have gained popularity as plants show different bioactivities and less harmful effects. This study focused on the formulation of antidiabetic syrup using *in vitro* antidiabetic activity-evaluated plants, *Garcinia quaesita*, *Bunchosia glandulifera* and *Coleus hadiensis*. Initially, three different aqueous syrup bases were prepared using Saccharin (0.25%), Sodium Benzoate (0.2%), and different concentrations of citric acid (0.04%, 0.05% and 0.1%). Prepared syrup bases were physically observed for any instability at room temperature ($28\pm5^{\circ}C$) for 90 days. Since all syrup bases were stable throughout the stability evaluation period, the syrup base with the optimum citric acid percentage (0.05%) was selected. The dose of each plant extract was calculated based on the IC_{50} (Half-maximal inhibitory concentration) and LC_{50} (Half-maximal lethal concentration) values obtained by *in vitro* antidiabetic and lethal toxicity assays, respectively. Three different syrup formulations (F1, F2, and F3) were prepared and 50 µL of each formulation was subjected to α-amylase inhibitory assay. Then their physical stability and physical and chemical properties such as color, odor, appearance and pH were analyzed at 10-day intervals for 90 days. The syrup formulations that contained two plant extracts (F2- *G. quaesita*, *C. hadiensis* and F3- *G. quaesita*, *B. glandulifera*), showed high α-amylase enzyme inhibition (83.12% and 79.01%, respectively) compared to the syrup formulation with all three plant extracts (F1) (56.17%). All three syrup formulations showed efficacy, were physically stable throughout 90 days and were within the pH of 2.8-3.4 with a pleasant aroma. Their color was brown with a clear appearance and did not change throughout the study period. Accordingly, all three formulations possess commercializing potential. Thus, a palatability evaluation study should be done to select the best palatable formulation/s.

Keywords: Antidiabetic, *Bunchosia glandulifera*, *Coleus hadiensis*, *Garcinia quaesita*, Syrup

Knowledge, Attitudes and Practices on Commonly used Veterinary Vaccine in General Public in Colombo District

C. S. Wickramage[1], P. A. R. M. Pathiraja[1], N. M. G. Silva[1], W. K. A. W. Thilakarathne[1], N. B. K.1Thathsarani[1], G. Jayaweera[2], W. M. K. M. Ratnayake[3#]

[1]Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Sri Lanka

[2]Department of Basic Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

[3]Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka

kalpani.ratnayake@cinec.edu

Abstract- Today, many people like to raise pets as companions. Having a pet comes with a great sense of responsibility. Proper nutrition, vaccination, worm treatment and tick/flee control are the basic healthcare that is needed to provide to pets and awareness of those is important to maintain proper practices in animal welfare. Hence, this study aimed to investigate knowledge, attitudes, and practices regarding the commonly used veterinary pharmaceutical products by the general public in the Colombo district. A descriptive cross-sectional survey was performed among the general public more than 18 years old, in the Colombo district (N= 100) using a structured questionnaire. The ethics clearance was obtained from the Ethics Review Committee, CINEC Campus. Among the participants, 59 % were male, and the remaining 41% were female. Further, there were 8% veterinarians. Among the participants, 71% had had pet dog or cat and 29% did not have any pet. Among the participants, 60 % strongly believed that pets need vaccination annually while 1% strongly disagreed with that. Further, 68%, 49% and 68% strongly believed that Anti-rabies (ARV), Distemper, Hepatitis and Leptospirosis (DHL) and Parvo vaccines are essential for dogs respectively. Also, 425 strongly agreed with the statement that ARV vaccination is essential for cats, while 3% strongly disagreed. Further, among the participants, 28% strongly believed that vaccines can cause allergies to pets and 38% believed that the brand of the vaccine is important. As the results showed, although people are facilitating to provision of vaccines to their pats, they do not possess enough awareness about it. Hence, it could be concluded that some of them require further knowledge on that.

Keywords: Veterinary, Vaccines, Pets

Investigation of the In-vitro Antimicrobial Effects of Shaving Creams and Shaving Foams Available in Sri Lanka Against the Human Natural Flora *Staphylococcus aureus*

K.P. Vidanapathirana[#1], D.N. Rajkumar[1], N. Karunarathne[1], S. Perera[1], I. Shavinka[1], N. Deshan[1], V.A. Bodhinayaka[1] and L.M. Hettihewa

Department of Biomedical Science, Faculty of Health Science, CINEC Campus, Sri Lanka[1]

< kawyapahani@gmail.com>

Abstract – The natural flora of the human body is the term used to describe the microbial population on the skin and mucous membranes. *Staphylococcus aureus* is one of the causative agents of a large number of clinical illnesses and infections in humans and inflammation such as pseudo-folliculitis barbae. The present study aimed to determine the antimicrobial activity of commercially available shaving cream and foam in Sri Lanka against human natural flora *Staphylococcus aureus*. Commercially, available each ten (10) shaving creams and shaving foams (n=20) and the *Staphylococcus aureus* (ATCC-25923) strain were purchased for analysis. The spot-plate method was performed to determine the mean effective concentration via 40%–90% concentration suspension series. Antimicrobial activity was determined via the spread plate method and optical density (OD) at 600 nm wavelength. The minimum inhibitory concentration (MIC) was obtained via the tube method. The statistical analysis was carried out via Microsoft Excel 2010 and SPSS V23.0. The mean effective concentration for shaving cream and foams were 72.32% and 69.46% (%w/v) respectively and the values were obtained via spot-plating method via quantifying bacterial numbers (CFU/ml). The spread plate method on blood agar plate and values obtained via OD_{600} absorbance revolved, out of the twenty samples, four samples exhibit complete inhibition of the *Staphylococcus aureus*. Compared to the shaving foams (60%), shaving creams (80%) showed, significant antimicrobial activity against *Staphylococcus aureus* (P= 0.031, $p<0.05$). Compared to the control, 85% of samples exhibited the significant difference in absence of the beta-hemolytic property of *Staphylococcus aureus* (P=0.003, $p<0.05$). MICs for the shaving cream and foams were 36.16 mg/ml and 17.36 mg/ml, respectively. The shaving creams and foams with both antibacterial natural and chemical specific composition investigation combined with MIC, which exhibited the complete inhibition against clinically important skin flora *Staphylococcus aureus* along with lack of beta-hemolytic property is important.

Keywords: Antibacterial-activity, *Staphylococcus aureus,* Shaving cream.

Investigation of the Antimicrobial Activity of Secondary Metabolites Produced by Selected *Aspergillus* Species Against Pathogenic Microorganisms

J.Vithushan[#1], H. Natasha[1], B. Priyantha[1], R. Wandana[1], S. Edirisinghe[1] and O.D.K. Perera[1]

Department of Biomedical Science, Faculty of Health Science, CINEC Campus, Sri Lanka[1]
< Vithushanjustin1997@gmail.com >

Abstract – Antibiotics serve as therapeutic agents, offering a potent and proficient strategy for diagnosing and treating bacterial infections, and inappropriate utilization causes resistance to these drugs. Hence, it is crucial to explore new naturally derived antimicrobial products that are effective and have minimal side effects. The present study aimed to determine the antimicrobial activity of secondary metabolites produced by *Aspergillus fumigatus*, *Aspergillus flavus*, and *Aspergillus niger* against the five (n=5), *Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli,* and *Pseudomallei spp.* That is clinically important and prevalent pathogenic microorganisms. The secondary metabolites of dry *Aspergillus* species fungal mass were obtained via both liquid-liquid extraction and organic extraction methods using ethyl-acetate which cultured on potato dextrose broth and potato dextrose agar. The disk diffusion method was performed on Muller Hinton and Blood Muller Hinton in order to evaluate the antimicrobial susceptibility. The diameter of the clear zones (mm) was measured according to the CLSI guideline. The statistical analysis was obtained via Microsoft Excel 2010 and SPSS V23.0. *Aspergillus fumigatus* exhibits antimicrobial activity against all five microorganisms extracted from broth mediums: *Staphylococcus aureus* (28.11),*Pseudomallei spp.* (23.56), *Pseudomonas aeruginosa* (16.22), *Escherichia coli* (12.44), and *Streptococcus pyogenes* (14.89). Compared to the positive control, *Aspergillus fumigatus* exhibited the significantly highest antimicrobial activity against *S. aureus* and *Pseudomonas aeruginosa* ($P=0.037, p<0.05$). *Aspergillus niger* and *Aspergillus flavus* shown sensitivity against *Staphylococcus aureus* (12.33), (17.67), *Pseudomonas aeruginosa* (10.89), (11.11), and *Streptococcus pyogenes* (9.67), (11.22), respectively. Compared to *Aspergillus niger* (60%) and *Aspergillus flavus* (60%), secondary metabolites of *Aspergillus fumigatus* (100%) showed significant antimicrobial sensitivity against all five microorganisms ($P=0.028, p<0.05$). Further, the liquid-liquid extraction method exhibited the efficient antimicrobial activity compared to the organic extraction method (<0.05). *Aspergillus spp.* secondarymetabolites show promise against pathogenic bacteria, emphasizing the importance of investigating these specific secondary metabolite compounds for potential applications.

Keywords: Secondary metabolites, *Aspergillus* species, Antimicrobial-activity.

Novel Synthesis of Piperine and Ascorbic Acid Co-crystals

G.R.Y. Mallawarachchi[1], W.A.U. M. Premarathna[1], R.G.W.D.B. Rajapaksha[2] and S.L.A Gunawardana[#1]

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus,   Malabe, Sri Lanka[1],
Department of Pharmacy, Faculty of Health Sciences, The Open University of Sri Lanka[.2]

<shehara.gunawardana@cinec.edu>

Abstract- Co-crystals are multi-component crystals with enhanced pharmacological outcomes due to their improved physiochemical properties. The present study focuses on the synthesis of co-crystals which can enhance the chemical stability, mechanical behaviors, solubility, bioavailability, and permeability when developing a pharmaceutical product, using piperine as the primary Active Pharmaceutical Ingredient (API) and water-soluble ascorbic acid as the co-former. Piperine, known for its potent anti-inflammatory and antioxidant properties, is derived from _Piper nigrum_ (Black pepper) dried seeds and purified through reflux condensing using 1-Propanol and recrystallization using Ethanol. Various ratios of piperine and ascorbic acid were combined in specific molar mass ratios to obtain different co-crystals. Their melting points were determined to evaluate the purity of the synthesized piperine co-crystals. Subsequently, the morphological characteristics of the synthesized co-crystals were examined using an optical microscope, and the most promising co-crystals were selected for further analysis through Fourier-Transform Infrared Spectroscopy (FTIR). The FTIR tests were conducted on both neat samples and prepared test samples. The obtained melting points for the test samples were 115.2°C (2:1), 164.8°C (1:3), 155.6°C (1:1), 138.3°C (2:3), 156.4°C (1:1), 112.8°C (3:1), and 136.4°C (1:2). The FTIR results indicated that the Piperine to Ascobic acid 1:2 and 2:1 ratio samples exhibited more favorable characteristics compared to the neat samples. Moreover, the melting point results demonstrated that stable co-crystals were formed as the ascorbic acid ratio increased. Samples with melting points below 129°C were identified as non-co-crystallized forms due to the presence of ascorbic acid as an impurity. The results of the study validate the successful synthesis of piperine-ascorbic acid co-crystals, highlighting their potential in pharmaceutical applications.

Keywords: _piperine, co-crystals, ascorbic acid_

Determination of Pathogenic Microorganisms in Commercially Available Shawarma Food in Colombo District Sri Lanka

M.D.I.Y. Mahawatte[#1], S.S.Kudagodage[1], P.G.N.T. Rajakaruna[1], E.T.D.M. Weerasinghe[1], H.M.P.M.W. Bandara[1], O.D.K. Perera[1] and V.A Bodhinayaka[1]

Department of Biomedical Science, Faculty of Health Science, CINEC Campus, Sri Lanka[1]

<yashodaramahawatte@gmail.com>

Abstract – Street foods are culinary items that are prepared and vended in open-air or public spaces. Street foods such as shawarma are influenced by the surrounding environment and exposure to contaminants which are potential factors of foodborne illnesses. The present study aimed on determination of prevalence and identification of pathogenic bacterial contaminants in fresh shawarma samples obtained from three distinct regions where most popular in Sri Lanka, namely Nugegoda, Aluthkade, and Mount-Lavinia. Fifty (n=50) random shawarma samples were collected from three different regions of commercial markets. Isolated microorganisms were then identified via conventional standard methods using Biochemical keys identification tests and culture methods. The statistical analysis was obtained via SPSS V23.0 and Microsoft Excel 2010. Out of 50 samples, 10 samples (20%) were negative and 40 samples (80%) were positive with growth. Seven pathogenic bacterial species namely; *Escherichia coli* (25%), *Acinetobacter spp.* (7.5%), *Salmonella spp.* (25%), *Klebsiella spp.* (10%), *Pseudomonas spp.* (05%), *Shigella spp.* (12.5%), *Vibrio spp.* (7.5%) and *Protease spp.* (7.5%) were identified. Among the contaminated samples, 35% of microorganisms were lactose-fermented (LF) while 65% of microorganisms were non- lactose-fermented (NLF) microorganisms. Among the LF microorganisms, 71.4% of *Escherichia coli* following 28% of *Klebsiella spp.* were detected and among the NLF microorganisms, 38% of *Salmonella spp.* following 19% of *Shigella spp.* were detected. Compared to the Nugegoda, Aluthkade (P= 0.025, *p<0.05*) showed a significantly highest contamination in LF microorganisms. Further, compared to the Aluthkade (50%), both Nugegoda (27.5%) and Mount-Lavinia (22.5%) (P= 0.038), *p<0.05*) showed significantly less pathogenic contamination. Further, highest significant *Escherichia coli* (15%) and *Salmonella spp.* (12.5%) contamination was detected in Aluthkade (P=0.008, *p<0.05*). All three geographic regions exhibited pathogenic microorganism contamination by a minimum of three distinct pathogenic variants including *Escherichia coli* and *Salmonella spp*. Therefore, it is imperative to enhance the quality of street food products.

Keywords: Contamination, Street food, Foodborne pathogens.

Heterogenicity of Culturable Aerobic Microbiota in the Larval Stage of the Midgut of the Filariasis Vector, *Culex quinquefasciatus* in Gampaha District, Sri Lanka

H.A.K. Ranasinghe[#1], H.E.M.R.T.K. Hathnagoda[1], P.A. Gunathilake[1], K.A.T. Buddhinee[1],
W.D.P. Welgama[1], and P.K.H.N. Gunarathna[1]
Department of Biomedical Science, Faculty of Health Sciences, CINEC, Malabe, Sri Lanka[1]
<achinikoshilaa@gmail.com>

Abstract- Potential roles of symbiotic bacteria found in the midgut of the mosquitoes, which encourage for the vector control interventions are maintainance of the vector's basal immune activity, immune priming, growth, host-parasites interaction, and determination of vectorial capacity. This study focuses on screening of distinctive features of midgut bacteria of larval *Culex quinquefasciatus* as an essential fundamental step to develop a progressing technique in Sri Lanka known as the the paratransgenesis. Mosquito surveys were conducted from September 2022 to December 2022 at 3 sites (Kelaniya, Gampaha, and Mirigama) in the Gampaha Medical Office of Health (MOH) area of Sri Lanka. 3rd instar larvae were sacrificed using a cold shock and 70% Ethanol respectively. Surface sterilization was performed using 70% ethanol followed by rinsing with phosphate buffer saline(PBS). The Midgut of the larvae was dissected and the midgut of ten individuals was pooled in sterile PBS (250 µL) to make a homogenized lysate. A dilution series (10^0- 10^{-7}) was madefrom lysate and 100 µL from each dilution was plated on Plate Count Agar and pure cultures for each microbe were obtained. Isolated bacteria were subjected to 16S rRNA amplification. A total number of 5 bacterial families (Staphylococcaceae, Streptococcaceae, Neisseriaceae, Moraxellaceae, and Micrococcaceae) were identified from the larvae. Family Micrococcaceae (75%) and Neisseriaceae (2%) were found as the highest and least abundant bacterial families respectively. Better separation of colonies was observed at 10-3, 10-4, and 10-5 dilutions. Species composition was dominated by 7 major genera; *Norcadia, Streptococcus, Staphylococcus, Aerococcus, Gardenerella, Veillonella,* and *Anaerobic cocci. Streptococcus* was identified as the most abundant microbial genera isolated from the midgut. Among all the field-caught larval strains, the relative distribution of midgut microbes differed significantly from each other. The research data strongly inspires further investigations to explore the significant usage of the bacteria in paratransgenesis control approaches.

Key words: mosquito, paratransgenesis, symbiotic

Identification of Pathogenic Bacteria in Water Resources in Colombo District, Sri Lanka

A.S.S. Alahakoon[#1], H.G.G. Opeshala[1], S.A.G. Priyadarshani[1], W.M.R.C. Ranasinghe[1], V.A. Bodhinayaka[1] and O.D.K. Perera[1]

Department of Biomedical Science, Faculty of Health Science, CINEC Campus, Sri Lanka[1]

< anjulas01@gmail.com>

Abstract – Access to clean drinking water is vital for public health, yet a considerable segment of the global population faces challenges in obtaining uncontaminated water sources, primarily due to the presence of pathogenic bacteria. The present study aimed to determine pathogenic bacteria in water resources of the Colombo district of Sri Lanka. Fifty (n=50) samples were collected randomly from wells in Awissawella, Hanwella, and Hokandara areas which prevalent for contamination in the Colombo district. All fifty samples were processed via both centrifugation and non-centrifugation methods. The spread plate technique was performed on nutrient agar to isolate the pathogenic microorganism. The conventional standard biochemical identification keys and culture methods were performed for further identification of bacteria. The statistical analysis was obtained via SPSS V23.0 and Microsoft Excel 2010. Out of 50 samples, 24% of water samples were negative for pathogenic growth, while 76% were positive for growth. Eight pathogenic bacterial species were identified, namely; *Klebsiella spp.* (5.2%), *Pseudomonas spp.* (5.2%), *Escherichia coli* (26%)*, Enterobacteria spp.* (13.15%), *Salmonella spp* (2.6%), *Shigella sonnei* (23%), *Shigella flexneri* (21%) *and Protease spp* (2.6%). both centrifuge and non-centrifuge methods did not exhibit a significant difference in detection (P=0.056, *P*>0.05). Among positive water samples, 44.7% pathogenic microorganisms were lactose-fermented (LF) and 55% samples were contaminated with non-lactose-fermented (NLF) microorganisms. In Awissawella, water sources exhibited the highest microbial content at 60%, with a predominant composition of *Shigella flexneri* (39%) was detected in significantly (P=0.025, *p<0.05*). Moreover, *Escherichia coli* exhibited the most substantial contamination in all three regions, with Awissawella recording the highest prevalence at 50% (P=0.008, *p<0.05*). The study revealed contamination across all regions with *Escherichia coli,* an indicator of pathogenic microorganisms in water, and potential stool contamination by *Shigella spp*. indicate implementing appropriate measures to ensure the safety of drinking water sources in the Colombo district is important.

Keywords: Contamination, Water resources, Drinking water.

Detection of Mechanically Transmitted Bacteria by *Musca domestica* (Diptera: Muscidae)

W.A.N.S. Perera[1], M.G.P.G. Hasangika[1], W.M.P. Prarthana[1], M.D.D.W. Mudalige[1], D.G.R. Divyanjalee[1], H.A.K. Ranasinghe[#1], E.H.L Perera[1] and M. Hettihewa[1]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe.[1]

<achinikoshilaa@gmail.com>

Abstract- House flies (*Musca domestica*) have been identified as a mechanical vector, transmitting a range of infectious diseases including cholera, shigellosis, salmonellosis and skin infections. They live closely with humans and domestic animals, and frequently found in areas of human activities. The present study was conducted to identify the pathogenic microbes transmitted by house flies since the related knowledge is not available in Sri Lankan settings. House flies were collected from Malabe MOH area from September- December 2022 using a prepared bait trap. Collected houseflies were identified to the species level using standard identification keys and were sacrificed using a cold shock. The house flies were washed to collect the bacteria on their outer surface, in sterile PBS (250 µL) to make a homogenized lysate. A dilution series (10^0- 10^7) was made from lysate and 200 µL from each dilution was plated on Plate Count Agar and pure cultures at 35ºC for 24-48 hours for each microbe were obtained. The isolated microbes were identified by performing Gram's staining and biochemical tests. *Acinetobacter* spp. *Enterococcus* spp., *Serratia* spp, *Klebsiella* spp, *Staphylococcus* spp., *Pseudomonas* spp. and *Escherichia* spp. were identified as mechanically transmitted bacteria from houseflies. The most abundant bacteria were *Staphylococci* spp. (36.303%) followed by *Escherichia* spp. (21.452%) and *Pseudomonas* spp. (17.162%); while other bacteria was present in less proportions. The diversity indices; Simpson's Index (D=0.25), Shannon-Weiner Index (H=1.472) and Evenness Index (J=0.6393) have proven that there is a significant diversity in the bacteria genera transmitted by the house flies in the study area. The identified genera of the bacteria include potential pathogenic bacterial species which could cause mild to severe illnesses. Hence, the present study findings emphasize the importance of house fly control measures and community awareness programs in the study site to reduce the pathogenic bacterial transmissions.

Keywords: biochemical, diversity, housefly, pathogenic

Molecular Based Identification of Dirofilariasis Vector Mosquitoes in Colombo and Gampaha Districts in Sri Lanka.

H.A.K Ranasinghe[1], H.G.N.T Rathnayake[1], P.M.B Pannila[1], D. V Wickramarathne[1], N.S Kudhoos[#1] P.W.D Kasurika[1] and E.H.L Perera[1]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe[1]

<nskudhoos@gmail.com>

Abstract – Dirofilaria is genus of parasitic nematodes that are transmitted to mammals, including humans, through the bite of infected mosquitoes. Sri Lanka despite being an island nation, is not exempt from the presence of Dirofilaria vector species. The molecular detection of the Dirofilaria vector species in Sri Lanka has not yet been attempted yet. Therefore, the present study was conducted for molecular characterization of Dirofilaria vectors in Colombo and Gampaha districts of Sri Lanka, in order to examine the link between Dirofilaria parasites and mosquito vector species. Mosquito samples were collected from Ja-Ela and Diwulapitiya MOH areas in Gampaha district and Piliyandala MOH area in Colombo district. Adult were collected using a mouth aspirator at outdoor resting sites following the guidelines described by the World Health Organization. Sampling was done during October to December 2022 and 107 adult female mosquitoes were collected from *Armigeres* and *Aedes* genera. Genomic DNA was extracted and performed the PCR amplification using designed primers specific to parasites. As per mosquitoes collected, *Armigeres subalbatus* was the most abundant species (76.63%) followed by *Aedes* (23.36%). Interestingly, *Aedes* was the least abundant genera in both Gampaha and Colombo districts during the collection period. But the analyzed sequencing results did not reveal any vector genera with dirofilaria parasites. The findings of this study will contribute to the existing knowledge of Dirofilaria distribution and epidemiology in study site. Vector mosquito collection from other MOH areas in district and molecular characterization of dirofilaria vectors is recommended.

Keywords: Dirofilaria , Molecular-diagnosis, Mosquito

Diversity of Culturable Aerobic Bacteria Transmitted by *Ctenocephalides canis* in Kaduwela MOH Division, Sri Lanka

S.D.R. Kariyawasam[1], B.M.J. Chamathka[1], P.K.A. Seneviratne[1], H.A.V. Dilshan[1] and H.A.K. Ranasinghe[#1]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe.[1]

<achinikoshilaa@gmail.com>

Abstract- Fleas are capable of transmitting a number of zoonotic pathogens that are extremely important for human health. In addition to the direct consequences of blood feeding, *Ctenocephalides* species play a critical role as effective vectors for a variety of pathogens, many of which are zoonotic. Various studies have been conducted in Sri Lanka on the identification of disease-causing agents transmitted by insects such as ticks and mites, but no studies have been conducted on the identification of microbes transmitted by fleas in Sri Lanka. By understanding the knowledge gap, public health officials can better understand the epidemiology of diseases and develop more targeted control strategies. Therefore, the present study focused on the screening of microbes transmitted by *Ctenocephalides canis.* Adult flea collections were conducted from May 2022 to August 2022 in Kaduwela Medical Office of Health (MOH) area of Sri Lanka. The collected fleas were identified to the species level using standard identification keys. Adult fleas were sacrificed using a cold shock and surface sterilization was performed using 70% ethanol followed by rinsing with phosphate buffer saline (PBS). The fleas were dissected and dissolved in sterile PBS (250 µL) to make a homogenized lysate. A dilution series (10^0- 10^{-7}) was made from lysate and 100 µL from each dilution was plated on Plate Count Agar and pure cultures for each microbe were obtained. The isolated microbes were identified by performing biochemical tests. A total number of 3 bacterial families (Moraxellaceae, Neisseriaceae, and Micrococcaceae) were identified from the fleas. Family Moraxellaceae (81%) and Micrococcaceae (3%) were found as the highest and least abundant bacterial families respectively. Better separation of colonies was observed at 10^{-2}, 10^{-3}, and 10^{-4} dilutions. Species composition was dominated by 3 major genera; *Branhamella, Neisseria,* and *Micrococcus.*These findings strongly warrant further investigations to explore the potential usage of data in potential flea control approaches and awareness programs. Molecular identification of the isolated microbes to the species level is recommended.

Keywords: control, disease, flea, microbe, zoonotic

Analysis of the Climatic Risk Factors Affecting Transmission of Parasites Causing Rural (Lymphatic) Filariasis in Galle District, Sri Lanka.

D.H.N. Devagiri[1], D.P.T. Edirisinghe[1], I.U. Malalasekara[1], W.A.J. Dewmanthi[1], W.M.I. Kalpani[1] and E.H.L. Perera[#1]

Biomedical Science Department, Faculty of Health Sciences, CINEC Campus, Malabe.[1]

< harshani.perera@cinec.edu>

Abstract- Lymphatic filariasis is a neglected tropical disease estimated by the World Health Organization which is caused by *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*. The disease is transmitted by mosquito vectors including *Mansonia spp.*, *Culex spp.*, *Aedes spp.*, and *Armigeres spp.* Transmission of the disease is largely affected by climatic factors. The current research focused on analyzing the climatic risk factors affecting transmission of the rural filariasis which is caused by *B. malayi*. The study was a 12-month longitudinal prospective study from the period of January 2022 to October 2022 at the MOH areas of Balapitiya (Test area) and Baddegama (Control area). The Secondary meteorological data of climatic factors were obtained from the Meteorological Department, Colombo. The disease incidence of *B. malayi* was recorded monthly and analyzed using SPSS 25.5 statistical software. According to the results, the highest incidence rate (n=18) was reported in August 2022 for the study site of Balapitiya. The Pearson Correlation test at 95% CI had shown that rainy days (P=0.7883), minimum humidity (P=0.458), minimum temperature (P=0.0192) were correlated positively with the LF cases while windspeed (P=-0.0606), and maximum temperature (P=-0.251) correlated negatively. There is a strong positive relationship between the disease incidence with rainy days while minimum humidity correlated moderately. The Galle District receives a relatively higher rainfall during the period of Southwest monsoon season (May to September) leading to the abundance of potential *Culex* and *Mansonia* mosquito breeding sites, which could be the reason for reporting the highest incidence rates on month of August. Further, climatic factors such as rainy days, minimum humidity could have a potential to act as climatic risk factors which increase the vector breeding and oviposition affecting to the transmission of rural filariasis in the study site.

Keywords: Lymphatic, Brugian, Mansonia, Climatic risk factors, Galle

Psychological Well-being and Anxiety among Women with and without Menstrual Disorder

Ishari Wijesinghe[#1]

Department of Health and Medical Sciences, Faculty of Health Sciences[1]
<Ishari.Wijesinghe@cinec.edu>

Abstract: The present study was undertaken to study the level of psychological well-being and anxiety among women with and without menstrual disorders. Menstruation is a monthly process where the uterus sheds, allowing blood and tissues to enter the vagina. Hormones control this process, with the pituitary gland and ovaries producing hormones. Eggs are implanted, and the ovaries release them for fertilization, whereas anxiety, a negative mood state, can cause individuals to limit activities and interfere with daily life. Anxiety disorders are diagnosed when feelings persist for at least six months. The study aims to evaluate psychological wellbeing and anxiety levels among women with and without menstrual disorders, and to identify the significant relationship between these factors. Psychological wellbeing and anxiety among women with and without menstrual disorders are dependent variables. The sample included 80 participants, comprising 40 women with menstrual disorders and 40 women without menstrual disorders. A purposeful sampling method was used for data collection. Participants belonging to the age group of 18–29 were included in the study, and all the participants were educated. Ryff's psychological well-being scale was used to assess psychological well-being in women with and without menstrual disorders. The Hamilton scale of anxiety was used to assess anxiety among women with and without menstrual disorders. The obtained results were analyzed using an independent sample t-test and Karl Pearson's coefficient of correlation. Menstrual disorder-related women have better psychological well-being compared to those without, possibly due to their increased awareness of maintaining it. Women without menstrual disorders experience lower anxiety levels due to managing symptoms and societal roles. No significant relationship exists between psychological well-being and anxiety, suggesting that anxiety does not impact psychological well-being.

Keywords: Menstruation, Anxiety, Menstrual disorders, psychological wellbeing

Impact of COVID-19 on Digital

Health Literacy among Non-state University Students in Colombo District, Sri Lanka

I.A. Salwathura[#1], A.D. Dias[1], D. Y.N. De Silva[1], R.M.M.U.M. K. Rajanayake[1], M.P.A.P.M. Pathirana[1], H.A.H. H. Madhushika[1,] S.P.S.M.Silva[1]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka.[1]
<irukisalwathura@gmail.com>

Abstract – During the COVID-19 pandemic period, digital technologies have played a significant role in communicating health strategies of government and public health authorities. It is observed that some students still possess limitations for digital health literacy. Therefore, this study aimed to better understand the digital health literacy levels of non-state undergraduate students and to investigate the origins of web-based platforms which are used to find information on COVID-19. Ethical approval for the research was obtained from Ethics Review Committee, CINEC campus. The questionnaire, which employed a stratified random sample technique to investigate participant demographics and experiences with digital health literacy during the pandemic was validated and circulated on-line to 383 undergraduate students, aged 17-28 years, across 10 selected non-state universities in Colombo District, Sri Lanka. An information sheet was used to give participants comprehensive information about the study, and a consent form was used to gain informed consent. This method preserved respondents' anonymity while enabling effective data collection. According to the results, 97.65% (n=374) of students used digital platforms to get daily updates about COVID-19. Out of which, 57.18% (n=219) of students almost always follow the instructions available on the internet to protect against COVID 19. Furthermore, 98.43% (n=377) of the students were confident on the available information on COVID-19 in the internet. According to the Chi-square test there was a significant association between the use of web-based encyclopaedias and following those web-based instructions to protect against COVID-19 (p < 0.001). Moreover, there was a significant association (p< 0.001) between the use of social media and following health related recommendations to protect against COVID-19. These results show the value of digital health resources in the context of the COVID-19 pandemic and point to a favourable propensity for using online resources for health-related information.

Keywords: _COVID-19, digital health literacy, electronic health literacy scale_

The Prevalence of Bacterial Contamination on Mobile Phones of Undergraduates of CINEC Campus, Malabe

G.H. Maduhansi[#1], A.J.H. De Zoysa[1], D.D. Weerasinghe[1], H.M.D.D. Lakshani[1], E.M.M.A.B.
Ekanayake[1], M.G.I. Anuradha[1], W.P.S.U. Wijewardhana[1] and P.T. Pasas[2]

Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus[1]
Department of Health and Medical Sciences, Faculty of Health Sciences, CINEC Campus[2]
⊲heshguruge@gmail.com⊳

Abstract- In the realm of research article composition, the surge of interest has been directed towards mobile phones as potential carriers of bacterial dissemination. Consequently, there arises a compelling necessity for an exhaustive exploration into the scope of bacterial contamination prevalent on mobile devices. This study endeavors to scrutinize the prevalence of microbial contamination on mobile phones belonging to undergraduates at CINEC Campus, Malabe. Furthermore, it seeks to ascertain whether a direct relationship exists between the bacterial contamination of mobile phones and the hygienic practices adhered to by undergraduates. To accomplish this, data pertaining to students' hygiene practices were systematically gathered from a cohort of two hundred and fifty undergraduates through the utilization of an online questionnaire. Subsequently, participants were categorized into three distinct hygiene levels: low, average, and high according to their scores for the hygiene related questionnaire. The investigation involved the collection of mobile phone samples utilizing sterile dry swabs under strictly aseptic conditions. These samples were subsequently subjected to analysis through the application of standard microbiological techniques. Within the participant cohort (n=250), the preponderance exhibited an average hygiene level (n=230, 92%), while a minority displayed low hygiene (n=14, 5.6%) and high hygiene (n=6, 2.4%) levels. Laboratory analysis of 80 distinct pure colonies unveiled a bacterial composition wherein 41.25% belonged to Staphylococcus species (n=33), 23.75% to Streptococcus species (n=19), 3.75% to Clostridium species (n=3), 2.5% to Bacillus species (n=2), and 16.25% comprised bacteria from the Enterobacteriaceae family (n=13).In summary, the investigation illuminated patterns in commuting behaviors, mobile phone usage, and hygiene practices among the study participants. The laboratory analysis further discerned a diverse spectrum of bacteria, with notable prevalence observed in Staphylococcus, Streptococcus, and Enterobacteriaceae species. These revelatory findings lay a foundation for a more in-depth exploration to unravel the intricate dynamics inherent in these observed patterns.

Keywords: bacterial contamination, mobile phones, undergraduate students

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Theravada Buddhist Concepts and Values Reflected in Alexander Pope's
An Essay on Man

Weerasinghe Mudalige Sawinde[1] and Wadiyaralalage Niluma Kavindi[2#]

Department of English, Faculty of Humanities and Education, CINEC Campus, Millenium Drive, IT Park, Malabe, Sri Lanka[2]
nilumakavindi@gmail.com[#]

Abstract- Augustan era poet Alexander Pope's *An Essay on Man* is considered to be his most philosophical work that discusses human nature in relation to God and the universe as a whole. In contrast, Theravada Buddhism rejects the idea of an almighty creator and focuses on providing people with a doctrine that allows them to make their worldly and spiritual lives better. However, upon further study, it can be observed that *An Essay on Man* has several instances that reflect Theravada Buddhist sentiments, especially concepts and values presented in the scriptures. This research aims to study as to what concepts and values from the Theravada Buddhist scriptures and culture are portrayed in Pope's philosophical poem. It utilizes a comparative analysis approach by comparing the original text by Pope and the Theravada Tripitaka. The results of the research show that there are similarities between the sentiments portrayed in *An Essay on Man* and concepts and values brought forth in the Theravada Tripitaka. It was found that these similarities include Pope's exploration of the dangers of exceeding humanity, and thus achieving the same level as God, parallel to what the Buddhist scriptures name the four unanswerable questions that humans should not ask in order to achieve enlightenment as shown in the *Cūḷamālunkya Sutta*. Pope's clever usage of the Cause-and-Effect theory, is explained in Buddhist scriptures as "Pattichcha Samuppada," as well as Pope's exploration of the concept of Karma through *An Essay on Man*. Findings of this study have the potential to add to the already existing knowledge on the influence of Theravada Buddhism in English literature and contribute to further research on whether Buddhist influence reached the western world earlier than originally discovered.

Keywords: Alexander Pope, Theravada Buddhism, An Essay on Man, Augustan era

Exploring How Youth and Young Adults Navigate the Situations of Love, Betrayal, and Separation Through Listening to English and Sinhala Songs.

M M D N Madawala[#1], H A D B Baggya[2], K A L N Randeniya[3], W D Madhuhansi[4]
Department of English, Faculty of Humanities and Education
navodyamadawala@gmail.com

Abstract- Music, as a personal and subjective experience, plays a significant role in how individuals navigate various life situations. This research delves into the ways Sri Lankan young adults navigate the complexities of love, betrayal, and separation by engaging with both English and Sinhala songs. The study investigates the frequency of song listening, the rationale behind song choices, and the emotional benefits of these choices. A mixed-method approach was employed, utilizing a quantitative online questionnaire distributed randomly among a sample of young adults above 21 years of age, who have encountered love, betrayal, or separation. Additionally, qualitative data was gathered through open-ended questions to provide a nuanced understanding of participants' experiences. The research findings indicate a strong relationship between emotional tendencies and the choice-making of listening to songs. Also, there is a close link between the preferred language and the decision-making process. The analysis shows a consistent inclination towards English songs over Sinhala or other languages across all three emotional contexts. Participants attribute this preference to the perceived benefits of English songs, such as evoking cherished memories, calming the mind with soothing melodies, and providing an escape from harsh realities during moments of love. In instances of betrayal, participants again turn to English songs, citing their worth in offering satisfaction and soothing the mind with melodic compositions. When grappling with separation, individuals exhibit a varied response to music, with some finding it beneficial for connecting to their situations and facilitating relaxation and inner reflection. However, a notable subset reports that music can actually worsen their emotions. Overall, this research provides insights into the therapeutic potential of music for Sri Lankan young adults, emphasizing the need for further investigation with rigorous methodologies, including more large and representative samples, and statistical analysis, to strengthen the generalizability of findings in this field.

Keywords: Young adults, Coping with emotions, Influence of music, Music as a therapy

Individualism in Haruki Murakami's Norwegian Wood: A Critical Analysis of One's Mirror Stage of Life and Individuation.

Wasala Wannaku Mudiyanselage Rishni Maleesha

Department of English, Faculty of Humanities and Education, CINEC Campus, Millenium Drive, IT Park, Malabe, Sri Lanka

hasinsalamaleesha@gmail.com

Abstract-Carl Jung examines individuation as a process of self-realization that indulges in the epiphany 'meaning of life'. On the other hand, Individualism is a moral stance and a doctrine that promotes the idea of the subjective uniqueness of each individual. In the 21st century, the notion of individuality interferes with social modernization and capitalization. The literary fiction, "Norwegian Wood", by Haruki Murakami, relates to the aforementioned concepts, exploiting the human urge to long for self-completion. This vision of individualism is practically enhanced by the novel's protagonist, Toru Watanabe, with his self-directed journey in search of his significant "other." Even though the mirror stage of life deals with infancy, Murakami strategically portrays the process of self-identification and the timely formation of a positive ego through his bildungsroman character, Watanabe. In Jung's theory, the process of individuation succeeds with regard to four self-developmental stages or archetypes: the self, the persona, the shadow, and the anima. Accordingly, this study attempts to examine Watanabe's intact with his archetypes to reach the realm of individuation. As qualitative research, the study is based on a thorough textual analysis of the mentioned novel, while a comparative analysis with Carl Jung's Individuation and individualism is brought forth to formulate a theoretical framework for the research study. Hence, the study emphasizes Watanabe's projection towards self-therapy through his subconscious vacuums, existential liberation, and manacled psychological ambiguity. Thus, this concludes that there is a subconscious urge within the novel's protagonist to attain the process of self-realization or individuation by adequately mirroring the distinction of individuality.

Keywords: Individualism, Individuation, Mirror stage of life, Carl Jung's archetypes, Toru Watanabe, Haruki Murakami, Norwegian Wood

How Child Rights are Violated as Reflected in Selected Literary Genres in Sri Lankan Literature.

W.A.Ovini Yasara Dayaratne

Abstract-This dissertation is about portrayal of child right's violations in selected literary works in Sri Lankan literature as novels, movies and short stories. The aim of the dissertation is to identify thedifferent aspects of violation of child rights in society as well as to raise awareness in society regardingthe issues identified. The study methodology adheres qualitative approach. It considers the international legal framework; United Nations Convention on the Rights of the Child (UNCRC) to raise the awareness of the reader. Moreover, statistical data from various research documents are cited to comprehend the gravity of the effect of child right's violation due to many social effects. Though there are many analyses about the selected literary works in this study, child rightsviolation is hardly taken into consideration. Therefore, this study refers to the key issue of child rights violation in society along with the legal documents. As a result of the study children's rightf or education, right to be protected from sexual abuse, right to be protected from labor work and right to be protected from violence and corporal punishments are portrayed in the selected literary works. Mainly poverty, class disparity, class discrimination and lack of education levels in parents cause child rights violation. Furthermore, this study depicts various solutions suggested by other researchers to raise awareness of the readers of this dissertation.

Key words; Child rights violation, education, labor, sexual abuse

Narrative Fusion in 'The Seven Moons of Maali Almeida': A Study of Magical Realism and Narrative Journalism in Depicting Sri Lanka's Civil War and Ethnic Conflict

Savin Edirisinghe

Department of English, Faculty of Humanities and Education, CINEC Campus, Malab

edirisinghesavin@gmail.com

The 2022 Booker Prize Winner 'The Seven Moons of Maali Almeida' by Shehan Karunatilaka revisits the 30-year-old Civil War and the ethnic conflict in the 1980s. Karunatilaka employs two contradictory narrative styles to recite the story of the protagonist 'Maali Almeida', magical realism and narrative journalism. 'Maali' serves as a photojournalist documenting the Sri Lankan civil war. The novel employs narrative journalism to recount historical events from the 1980s in Sri Lankan society, while Maali Almeida's character and story are shaped using magical realism. Magical realism blends reality with imagination, including myths and folklore, while narrative journalism uses storytelling techniques to present true stories. Combining these two narrative forms in a single novel is rare because they often negate each other's impact. Accordingly, this study attempts to examine the effects of the unique amalgamation of the two narrative styles on the story. The study is based on a comparative analysis that examines the effects that each of the narrative styles have on the story and each other; also, an in-depth textual analysis that explores the effects that the unique narrative style has on the story. Hence, the study depicts two main effects that the blend of narratives has on the story. Namely , the effect of a distinctive exploration of the protagonist's perspective and experiences offering a birds-eye view of the violence during the 1980s Sri Lanka and the effect of exploring actual accounts of historical events, offering a critical examination of the objective reality of Sri Lankan socio-political context. Thus, this concludes that in the case of 'The Seven Moons of Maali Almeida' the narrative fusion of the two contradictory narrative styles, magical realism, and narrative journalism, doesn't actually negate each other but instead enables a unique social critique.

Keywords: The Seven Moons of Maali Almeida, Magical Realism, Narrative Journalism, Sri Lankan Civil War, Socio-political, Social Critique

Indigenous Perspective and Eurocentrism : A Comparative Analysis of *Things Fall Apart* and *Heart of Darkness*

R. M. M. P. Karunathilaka

Department of English, Faculty of Humanities and Education, CINEC (Pvt) Campus, Malabe, Sri Lanka.
madhushakarunathilaka2244@gmail.com

Abstract -This research paper examines the narrative dynamics present in two major works from the colonial era: Chinua Achebe's *Things Fall Apart* and Joseph Conrad's *Heart of Darkness*. The study draws a contrast between the indigenous perspective vividly depicted in *Things Fall Apart* and the dominant Eurocentric viewpoint that pervades *Heart of Darkness*, thereby providing valuable insights into the divergent literary representations of colonial interactions within the African landscape. This study employs a comparative individual text analysis method to evaluate the depiction of Indigenous perspectives and Eurocentrism in *Things Fall Apart* and *Heart of Darkness*. This method allows for a thorough examination of how conflicting ideas are interwoven within the narratives of the selected works. The study uncovers that Chinua Achebe's *Things Fall Apart* places a strong emphasis on indigenous perspective, presenting a multifaceted representation of Igbo culture and identity, whereas Joseph Conrad's *Heart of Darkness* adopts a Eurocentric lens, further cementing preconceptions and Eurocentric ideals throughout its narrative, illustrating the profound differences in how these two work present colonial tales. In contrast to the Eurocentric mindset depicted in *Heart of Darkness*, Achebe's novel challenges stereotypes, humanizes African cultures and traditions, emphasizes their complexity and inherent value, ultimately reshaping the narrative of colonial interactions. Furthermore, the study provides insight into the function of these writings in serving as significant weapons for modifying society perspectives and promoting cross-cultural empathy, rather than merely expressing historical viewpoints. In conclusion, by juxtaposing *Things Fall Apart* with *Heart of Darkness*, the research highlights the significant distinctions in their portrayal of colonial narratives. This study advocates the vital importance of recognizing and engaging with diverse narrative viewpoints in literature, as well as advocating for a broader approach to the study of colonial narratives, particularly within the context of postcolonial and cultural studies.

Shaping Public Discourse: A Pragmatic Analysis of John F. Kennedy's Rice University Speech through Austin and Searle's Speech Act Theory

Thinuri Nuwanya Senerath Yapa

Faculty of Humanities and Education, CINEC Campus, Millennium Drive, IT Park, Malabe, Sri Lanka
yapathinuri@gmail.com

Abstract- Delivering one of the most historic speeches of the 20th century, former president of the United States of America, John F. Kennedy, kick started the moon race between the USA and the Soviet Union in the 1960s. This discourse analysis examines the influential speech delivered at Rice University, Houston, Texas in 1962, through the lens of J.L. Austin and John Searle's Speech Act Theory. By exploring the illocutionary and perlocutionary acts embedded within the speech, this qualitative study reveals the pragmatic dimensions and communicative strategies employed by Kennedy to effectively shape public discourse. Drawing on Austin's framework, the analysis highlights the speech acts used by Kennedy to influence the audience. Direct speech acts, such as assertives and directives, were employed to rally support for the national commitment to space exploration. The utilization of performative utterances, particularly the memorable phrase "We choose to go to the Moon," served to reinforce Kennedy's authority as a leader and ignite collective action. Furthermore, the analysis unveils how Kennedy strategically employed implicatures and presuppositions to mold the perceptions of the listeners and construct a shared vision of progress and exploration. Thereby, this discourse analysis underscores the lasting significance of Kennedy's Rice University speech in shaping public discourse. Through the application of Austin and Searle's Speech Act Theory, the study provides valuable insights into the pragmatic dimensions of the speech, highlighting its persuasive intent and performative impact. Understanding the rhetorical strategies employed in influential speeches enhances our comprehension of language use in political and persuasive contexts, offering valuable lessons for effective communication in both historical and contemporary settings. By examining the power of speech acts, this analysis illuminates the role of language in shaping societal perceptions and influencing collective actions, reinforcing the enduring impact of Kennedy's rhetorical prowess.

Keywords: Speech Act Theory, J.F. Kennedy, Rice University Speech, Pragmatic dimensions, Shaping public discourse

Feminine fictional characters, by female Victorian writers, who challenged conventional Victorian illusion of a 'perfect woman', in a feminist perspective.

Gayani D. Livera

Faculty of Humanities and Education, CINEC Campus, Sri Lanka
#dhanushika1livera@gmail.com

Abstract-This study postulates to deliver an in-depth analysis and a critical overview of the stereotypical image of a woman conjured by Victorian status quo, as opposed to the controversial feminine fictional characters presented by contemporary female writers. Commencing from the early 19th century, Victorians upheld rigorous traditions and irrational customs as tools to restrict the true potential of women. As a result, female authors such as Bronte sisters, Jane Austen and George Eliot used pseudonyms in perusing their careers as novelists, whilst advocating the resilient female victims from subtle socio-cultural discriminations. This study discusses the character traits and associated circumstances in the lives of significant female fictional characters as portrayed by aforementioned Victorian novelists. This is a qualitative research conducted through a deep textual analysis to a few iconic Victorian fictions. It had been convoluted by the idealists, that a Victorian woman should be either 'an angel in the house' or 'a mad woman in the attic'. Thus, education, freedom of speech and reasoning were forbidden luxuries for Victorian women, with only marriage to compensate all the moral and spiritual subjugations. The female characters forged in Victorian fiction demonstrate personality traits of being headstrong, well-read, opinionated and driven by strong determination, which caused unrest among customary associates who opposed such controversial conduct. These female characters are lively, strive to be and do more from the bare minimum they are provided with. Nonetheless, they, who become victims of social injustice, hypocrisies and prejudices are awarded with befitting endings or a peaceful parting by the writers, envisaging the real-life expectations of a woman and their need to be respected for their choices; irrespective to the yielded outcomes. In a society, that has morally evolved to vindicate the meme of a 'perfect woman' applauding to natural humane flaws, rediscovering Victorian feminine ideology is undoubtedly both insightful and resourceful.

Key words: Jane Eyre, Maggie Tulliver , Elizabeth Benet, Bertha Mason, equal rights, gender discrimination, feminism, social injustice, institutional corruption

An Analysis of the Role of the Miss Universe in Promoting Diversity and Inclusion:The Case of H'hen Niê, Angela Ponce, Zozibini Tunzi and Ornella Gunesekere

L.I. Manorathne [#1]

Department of English, Faculty of Humanities and Education, CINEC Campus, Millenium Drive, IT Park, Malabe, Sri Lanka.
lakshithamanorathne@gmail.com

The Miss Universe is one of the greatest events that celebrate womanhood for more than seven decades. Besides, the pageant annually showcases, on average, 80 delegations around the world empowering women to realize their ambition and build self-confidence as a catalyst for future success. In recent years, the pageant has garnered significant attention for its efforts to promote diversity and inclusion on a global stage. Thus, a case study has been done by employing a qualitative method, involving a questionnaire and the secondary data to present a comprehensive analysis to examine the experiences and impact, of four trailblazing contestants. First, H'hen Niê, a Vietnamese delegate, challenged traditional beauty norms and have broken down stereotypes as a tribal woman who was supposed to marry by the age of 14, next , Angela Ponce, the first openly transgender contestant in the pageant's history, sparked international conversations about inclusivity and transgender rights. Third, Zozibini Tunzi, the winner of Miss Universe 2019 marked a significant milestone in the promotion of African beauty and pride while inspiring young girls to embrace their natural beauty and cultural heritage unapologetically. And finally, Ornella Gunesekere, the reigning Miss Universe of Sri Lanka, who once lost the functionality of her legs due to a spinal cord birth defect and has broken down misconceptions of disability by conveying how to rise again. Ultimately, by examining their journeys in the beauty pageant, this research seeks to shed light on the evolving role of Miss Universe in breaking barriers and advocating diversity and inclusion. In addition, this study will help to overcome possible criticisms and limitations of the Miss Universe pageant's efforts to promote diversity and inclusion, acknowledging that the beauty industry as a whole, still faces challenges in this realm.

Key Words: Miss Universe, Beauty Pageant, Cultural Diversity, Women Empowerment

An Analysis of Gerda's Firm Influence in Provoking Einar's Hidden Desire to Become Transgender in the Movie, "The Danish Girl" by Tom Hooper

LI Manorathne [#1]

Department of English, Faculty of Humanities and Education, CINEC Campus, Millenium Drive, IT Park, Malabe, Sri Lanka.

lakshithamanorathne@gmail.com

For centuries, millennia even, gender identity and gender expression have been seen as some of the most debatable ideologies in the universe. However, when reaching the post-modern context, these ideologies have been vividly changed with the emergence of the transgender community. In brief, trans people experience confusion or discomfort about their biological gender due to several factors or influences and try to transition from their birth gender to -whatever the gender they encounter their intended gender expression. *The Danish Girl* by Tom Hooper recounts this transgender identity with a historical approach to the first transgender woman, Lili Elbe, who underwent a gender-affirming surgery in 1882 to become a woman. The movie runs for 119 minutes highlighting how Einar Wegener, the protagonist of the narrative, (post-gender, Lili Elbe) becomes a trans-woman even if he is portrayed as a fine gentleman who was married to his wife, Gerda for 19 years. Thus, the study aims at discovering one significant influence caused due to Gerda's abrupt behaviour that provoked Einar's hidden desire to become transgender. The methodology consisted of a qualitative method and the data was collected through note-taking, observations, and with the support of secondary data. Hence, based on the data collected by afore said approaches, it was found that Einar is depicted as a mere creation of Gerda that influenced him to deliberately summon his inner female desires all due to Gerda's solid involvement. Nevertheless, there may be other factors that influenced Einar to become transgender by putting himself in the grave. Consequently, these particulars could be addressed through future research while highlighting the attitudinal and behavioural changes of the main character toward transitioning.

Key Words: The Danish Girl, Transgender, Gender Identity, Gender Expression.

Comparison of Poets: London by William Blake and Composed upon Westminster Bridge by William Wordsworth's Viewpoints on the Industrialization in the City of London.

G.D. Timali Gunathilaka#1
Department of English, Faculty of Humanities and Education
time21gunatilaka@gmail.com

Abstract-In recent years, extensive research has been conducted on the industrialization of London city in many viewpoints. However, few studies have examined London city both as a devastated city and unaffected city. This study attempts to answer the question, of how comparatively selected two poets: William Blake and William Wordsworth who belong to the Romantic Era have different viewpoints about the industrialization of the same city: London. Thus, this research addresses the poem, London by William Blake and the poem, Composed upon Westminster Bridge by William Wordsworth. Even though William Blake directly reflects the industrialization in his poem, London, William Wordsworth indirectly reveals the future industrialization in London City through the poem, Composed upon Westminster Bridge. This study is employed in a comparative analysis, literary analysis, historical context, data collection, interpretation, and discussion. The findings of this study indicate Blake's perception towards London as an industrialized city, whereas Wordsworth sees natural beauty as a city that is not yet industrialized. Accordingly, this study reflects how William Blake criticizes the issues in London City: child exploitation, prostitution, capitalism, and poverty and its devastation whereas Wordsworth portrays how London's nature is calm and attractive .Besides William Blake discusses humans' suffering physically and mentally due to the impact of the industrial revolution while Wordsworth portraits people who enjoy indulging in nature. The research findings suggest that how selected two poets' perceptions are different from one another even though they are discussing London City in the same era.

Keywords: Industrialization, Issues in London City, Nature

Improving students' active participation for learning teaching process on ICT in *Vidyadarsha* Junior College

I.M.T.A.Jayangi#1

Department of Education, Faculty of Humanities and Education

thushiniabhilasha@gmail.com#

Abstract-ICT has become progressively important in teaching and learning by reason of its ability to enhance the quality of education, increase access to educational resources and improve communication between teachers and students. Furthermore, learning is not just between the student and the teacher but a part of whole classroom practice. When students are actively engaged in the learning process, the outcome is better. The knowledge, values and attitudes are attained better when active learning takes place. In order to have active participation the teachers need to know strategies to increase students' participation. The aim of this research is to develop students' abilities , to obtain active participation for teaching-learning process on ICT . The objectives of the research are to examine the problem of students' active participation for learning ICT, introduce effective learning teaching activities for ICT students in grade 6-9, and improve the competencies of students by using different teaching-learning methods relevant to ICT. The sample size of the study is fifty students (Grade 6-9 ICT) and three teachers. Observation schedule, questionnaire and interview schedule were used as data collecting instruments. According to research findings, most of the students are interested in practical lessons while learning ICT, when the teacher and the teaching materials are of low quality, students' active participation is low. In addition, most students actively participate in group discussion, whereas less active participation can be seen of students due to teacher-centered teaching-learning process. Use of multimedia projectors, and use of computers can be used to develop students' competencies. This study also sheds insights regarding the problems in the active participation of students in the teaching-learning process, the effective learning and teaching activities, and use of different teaching learning methods to improve students' competencies in classroom. Every teacher should perform in learning teaching process effectively; then increase of students' active participation in the classroom will be a reality.

Keywords: Active participation, Competencies, Learning teaching process

The Effectiveness of TED Talk in Developing Extensive Listening of English as Second Language (ESL) undergraduates in an online classroom

R.P.Dahanayake[#1], L.P.Basnayake[2]

Department of English Language Teaching, Faculty of Humanities, University of Kelaniya

ridmadahanayake@gmail.com

Abstract-Listening is a multifaceted process that plays a crucial role in the development of English as a second language (ESL). Two major approaches have been widely used in teaching listening skills; intensive and extensive listening. Intensive Listening (IL) involves, focused attention on specific details to understand a particular passage or conversation while Extensive Listening (EL) entails a broader approach to comprehend the overall meaning of the listening text from various sources. Even though researchers have advocated EL to improve learners' listening proficiency, the limited availability of suitable materials has always been a hindrance. Therefore, the current study incorporates TED Talk (technology, entertainment, and design) where informative and inspiring presentations are given by experts from various fields to educate the global audience. Hence, this study investigates the effectiveness of TED Talk in developing learners' listening skills and their perceptions about incorporating TED Talk in a virtual ESL classroom. This study was conducted employing 30 first-year undergraduates of the science faculty of the University of Kelaniya using an intact group design. The sample group was classified into two groups following a mix-method experimental design; experimental and control. The experimental group received teaching instructions with the independent variable; TED Talk whereas the sessions for the control group were conducted using CDs and DVDs, over a period of 5 weeks. The quantitative data and qualitative data were collected from pre-post tests and focus group interviews (FGI) respectively. The SPSS analysis revealed a statistical significance between the control group and the experimental group proving that the TED Talk has effectively influenced the ESL learners' listening skills. The thematic analysis of the FGIs showed that undergraduates preferred TED Talk because it enhanced learner autonomy, collaborative learning, motivation, and enthusiasm. The influence of TED Talk on other language skills can be an intriguing area for future researchers.

Keywords: TED Talk, Extensive Listening, undergraduates

Improving learning achievements based on the learning styles of the students via online learning

B.D.R.Anjalika

ridmianjalika98@gmail.com

Abstract-The COVID-19 pandemic has caused a significant shift in the education sector, with online learning becoming the primary mode of instruction. This has led to the need for educators to identify effective ways to enhance student's learning experiences in online environments. One area of focus is the identification of students' learning styles and tailoring teaching strategies to accommodate these preferences. Understanding learning styles is important because it can help educators to create a more personalized and effective learning experience for their students. This research aims to investigate how enhancing students' online learning experiences can improve their learning styles and enhance their academic performance. This study begins with a comprehensive literature review of previous research conducted in the area of online learning, learning styles, and academic performance. The literature review identified the gaps in the existing research and provided a foundation for this study. The methodology for this study involved conducting scientific research with experimental research of grade 8 students to identify their learning styles and perceptions of their online learning experiences. According to the VARK Model, the-researcher divided students and treated them according to their learning styles. The research data has been analyzed using quantitative methods to identify the most effective methods for enhancing online learning experiences and improving academic performance. Additionally, case studies of successful online learning experiences are used to provide practical recommendations for educators. The expected results of this research are practical recommendations for educators to enhance online learning experiences for students and improve their academic performance by accommodating their learning styles. These recommendations have been based on the findings of the survey data analysis and case studies.

Keywords: Learning Styles, VARK Model, Online Learning Materials

Teaching Vocabulary through Interactive Activities in ESL Classrooms with Language Diversity

Dileeshiya Rajarathna[1], AA Ishari Maduwanthi [#2]

Instructor in English, Department of English Language Teaching, University of Peradeniya[1],
Instructor in English, Department of English Language Teaching, Rajarata University of Sri Lanka[2]

dilki250@gmail.com

Abstract-This paper investigates the effectiveness of the inclusion of all the languages that the learners speak in interactive sessions in ESL classrooms to teach new vocabulary. The usage of different first languages in an ESL classroom to facilitate learning can be a challenge to most teachers as they do not speak the first languages of all learners. Although using the L1 was traditionally criticized as a hindrance to the learners' development in the second language, it is now considered to be a resource in providing learner-friendly ESL classrooms. Students who have been studying in ethnolinguistically-separated schools using their first language as the medium of instruction, come together in ESL classes at the university during these interactive sessions. In classrooms in which the learners speak different languages (Sinhala and Tamil), both languages are to be used whenever the use of L1 is required. Among several interactive sessions that are done in ESL classrooms, group work is very popular due to many reasons. The learners are required to work through the differences in their first languages and find a common ground to make the group work successful. This paper observes the effectiveness of using a group activity in creating a trilingual glossary to teach new vocabulary to first-year undergraduates in an ESL classroom at a state university. Data was generated through classroom observations that were done by one researcher. The observations focused mainly on learners' engagement, participation and overall task completion. After generating the data, the responses were analyzed thematically to identify the effectiveness of using this particular approach. The results showed that both teachers and learners found this activity useful in teaching/learning new vocabulary effectively.

Keywords: Inclusion, First language (L1), ESL classroom, Vocabulary, Interactive sessions

Effectiveness of roleplay in developing speaking and listening skills of Adult English as a Second Language context: A study conducted in Linea Aqua Company, Sri Lanka

H.S.U.Gunasekara, and N.G.L.D.Dulsara

Faculty of Humanities and Education, CINEC Campus, Malabe

Sakugunasekara2799@gmail.com

Abstract-This research delves into the crucial role that replays play in the cultivation of speaking and listening skills among adult learners of English as a Second Language (ESL). The importance of effective communication skills in the contemporary globalized world cannot be overstated. Adult ESL learners often face challenges in acquiring proficient speaking and listening abilities due to diverse linguistic backgrounds and limited exposure to the target language. This research seeks to investigate how the strategic incorporation of roleplays in ESL instruction can foster a deeper understanding of spoken language patterns, vocabulary usage, pronunciation nuances, and contextual comprehension. By employing a mixed-methods approach involving qualitative analysis of classroom observations and quantitative assessment of skill development, this study aims to uncover the specific benefits and challenges associated with integrating roleplays into ESL teaching methodologies. This research investigated to identify if the employees of an apparel company, who were not exposed to the English Language for a year or more, could increase their English proficiency. Their poor language usage decreased their usual English language listening and speaking skills. 20 Participants were chosen from the population of 50 of the age between 20-40. A pre-test was conducted by and through virtual sessions of teaching, the classes were conducted for two months, 2 hours per week. Class materials included playing videos (to improve pronunciation and improve body language) and dialogues. A post-test was given and the results show that adult learners can improve their listening and speaking skills through roleplays. The findings are expected to provide insights into the potential pedagogical enhancements achievable through the purposeful utilization of roleplay techniques, thereby offering educators and curriculum designers evidence-based strategies to optimize the ESL learning experience for adult learners.

Keywords: Roleplays, Speaking, Listening, Adult ESL learners

Effectiveness of using English cartoons to develop young learners' speaking and listening skills in English as a Second Language (ESL) context.

S.D.T Sewwandi

Faculty of Humanities and Education, Department of English
thakshilasewwandi1220@gmail.com

Abstract- Developing speaking and listening skills are essential among young learners in English as a Second Language (ESL) context. The purpose of this study is to investigate the effectiveness of using English cartoons to develop speaking and listening skills of young learners who lack an English-speaking background. Parental interviews were used to gain insights into the participants' background and their language usage at home. Accordingly, the study involved 20 participants (ages 5-7). Among them, six participants have been exposed to English cartoons since 3 years old while the remaining 14 have not. A comparative analysis was conducted to assess the impact of English cartoons on the participants' listening and speaking abilities. The results demonstrate that the group exposed to English cartoons revealed better use of the target language, displaying a broader vocabulary range in listening and speaking activities compared to the group without exposure. This suggests that English cartoons offer a rich and enjoyable exposure to the language by playing a significant role in ESL acquisition, even absence of an English-speaking background. This study emphasizes the potential benefits of integrating classrooms to enhance speaking and listening skills in young learners.

Keywords: English cartoons, young learners, speaking, listening.

Factors Influencing the Underrepresentation of Students in Selecting Information and Communication Technology (ICT) as an Ordinary Level (O/L) Subject: A Case Study

Hirusha Ranasingha

Department of Education, Faculty of Humanities and Education, CINEC Campus, Malabe, Sri Lanka.

<hiru394@gmail.com>

Abstract- The low enrollment rate for Information and Communication Technology (ICT) as an Ordinary Level (OL) subject at Gankanda Central College, Rathnapura, has raised timely concerns. The observable enrollment rate of students remains significantly low. The aim of this study is to identify the barriers obstructing students' selection of ICT as an OL subject and propose strategies to enhance student interest and engagement in ICT education. Data was collected through quantitative surveys. The sample consists of 36 students from Gankanda Central College. The surveys assessed students' perceptions, attitudes, and factors influencing their subject selection. Qualitative interviews provided deeper insights into the experiences and perspectives of students, parents, and teachers regarding ICT education at the college. Ten qualitative interviews were conducted. Based on the data obtained, the survey results revealed that approximately 47.22% of the students chose ICT, while approximately 52.78% of the students did not choose ICT. Individuals have varied reasons for choosing or not choosing ICT subject. Among those who did not choose ICT, 40% lacked interest in technology, 30% perceived limited career opportunities, 15% were influenced by their peers or family, 10% found the subject difficult, and 5% lacked personal IT skills. Some of the reasons highlighted by the qualitative interviews included concerns about the relevance of ICT in their chosen career paths, misconceptions about the difficulty of the subject, limited exposure to ICT in their previous education, and a lack of confidence in their IT skills. These findings highlighted the factors contributing to the underrepresentation of ICT at Gankanda Central College. The study expects to uncover barriers such as limited resources and infrastructure, societal perceptions, lack of awareness about career opportunities, and gender biases that contribute to the underrepresentation of ICT as an OL subject. The implications of the study will inform educational stakeholders, policymakers, and curriculum developers at Gankanda Central College to devise effective strategies in promoting ICT education. Enhancing students' interest and engagement in ICT at the OL level can encourage a future workforce equipped with the necessary digital skills.

Keywords: ICT education, Ordinary Level (OL), underrepresentation.

The effects of Tik Tok among social media users in age group of 20-30 years

Sawandi Madhushika Hewa Kandambi
Department of Education, Faculty of Humanities and Education, Cinec Campus, Malabe.
sawandi1999@gmail.com

Abstract-This study investigates the dual facets of TikTok: societal rejection and psychological satisfaction, among individuals aged 20-30, unveiling crucial insights into the complex dynamics of contemporary digital engagement. Leveraging quantitative analysis, the research scrutinizes the factors underpinning TikTok's societal resistance and its impact on users' psychological well-being. Through a survey conducted with 30 social media users in the age group of 20-30, a comprehensive understanding of societal attitudes towards TikTok emerged. The results indicate that 62% of participants expressed some form of rejection. These sentiments stem primarily from concerns about content authenticity (28%), apprehensions about privacy (22%), and perceptions of reduced face-to-face interactions (18%). The quantitative analysis underscores a collective unease regarding TikTok's influence on offline social interactions and user privacy. Simultaneously, TikTok emerges as a source of psychological satisfaction for a substantial portion (80%) of users within the target demographic. This satisfaction is attributed to the platform's entertainment value (42%), community engagement (29%), and avenues for creative expression (23%). Interestingly, the quantitative data also revealed that 16% of users acknowledge addictive tendencies stemming from TikTok usage, while 12% noted decreased involvement in offline activities. The study's quantitative analysis lays the foundation for nuanced conclusions. Societal rejection appears rooted in concerns around authenticity, privacy, and real-life interactions. However, the psychological satisfaction drawn from TikTok suggests its potential for positive impact, despite concerns of addiction and offline disengagement. These findings underscore the need for a balanced approach to digital engagement, acknowledging both the benefits and challenges posed by platforms like TikTok. In summary, this study's quantitative analysis unveils the intricate interplay between TikTok's societal rejection and psychological satisfaction, offering a robust foundation for understanding the multifaceted nature of modern social media usage among individuals aged 20-30.

Keywords: TikTok, societal rejection, psychological satisfaction.

Improve Grade four students' active participation for learning process on Mathematics and English

S.D.Nawalage
Department of Education [1], Faculty of Humanities and Education
<dewmininawa98 @gmail.com>

Abstract-This study focuses on improving Grade four students' active participation for learning process on Mathematics and English. Education is a means by which people develop and acquire knowledge, skills, values and attitudes. It paves the way for development and plays a vital role (serve as a catalyst) in bringing socio-cultural, economical, technological, political and environmental advancements. The researcher conducted the action research with two students in Grade four in a semi-government school in Western Province. This action research study aimed to improve primary students' active participation for learning process on Mathematics and English in Grade four in a semi-government school in the western province. The researcher observes students to identify their problems and applies remedial activities to solve them. This qualitative research uses a qualitative approach to interpret data. Tables are used to show the quantitative performance level of students. The sample of the research is the two students in Grade 4. Data are collected through observation, questioning, and documentary review, also the data collection instruments are, observational schedule, questionnaire, review plan. As a result of the study, I will introduce research based activities for improving students learning process. The expected outcome of this study is to improve active participation of students in Grade 4 for the learning process on Mathematics and English and introduce to other teachers in the school on research based effective activities to improve learning process of students in Grade 4.

Key words: active participation, quantitative approach, remedial activities

Sri Lankan English Morphology in English Newspapers in Sri Lanka: A Morphological Analysis

H.W.N.P. Hakadewaththe
Temporary Assistant Lecturer,
Department of English Language Teaching, Faculty of Humanities, University of Kelaniya.

nihak191@kln.ac.lk

Abstract - English has become the dominant language for worldwide communication in several domains including technology, commerce, industry, politics as well as education. With the emergence of world Englishes, Sri Lankan English (SLE) has emerged as an autonomous variant of English. In the "Dynamic Model of Post-Colonial Englishes" of Schneider (2007). The vocabulary of Sri Lankan English has been expanded through the constant incorporation of novel words generated through a variety of morphological processes specially through newspapers. Everything printed in a newspaper must be conveyed through the mechanism of language and encoding values into a message is fundamental for message delivery through language. As a consequence, the nature of the society or sub-culture in which the language exists determines what language contains in terms of emotional and cultural loading. Thus, the present qualitative asserting study mainly aims at finding the employment of SLE morphological processes in English newspapers in Sri Lanka from a linguistic perspective. The study focuses on "The Sunday Times" weekend newspaper from November 2022 to January 2023 incorporating a qualitative dominant content analysis and semi structured interviews to investigate three research questions. The study has comprised Murray's (1995) list of word creation processes and the theoretical framework of Gunesekera (2005), to investigate the morphological processes in SLE. The study identifies fourteen morphological processes respectively as borrowings, compounding, blending, back formation, reduplication, acronyms, abbreviation, conversion, coinage, affixation, clipping semantic change and semantic shift. The study further reveals that, borrowings, compounding, acronyms clipping and reduplication as the most productive SLE morphological processes in English newspapers. The study also suggests that there are several motivational factors for newspaper article writers to encompass SLE morphology in newspapers.

Keywords – Morphology, Newspapers, Perspectives, Productive, Sri Lankan English.

Challenges Encountered by a Sri Lankan Student with "Colour Vision Deficiency" in Academic and Daily Endeavour.

P. Weerawarna[#1], R.M.S. Surenika[2], L.B.B.P. Rathnaweera[3],

Department of English/ Faculty of Humanities and Education[1], Department of English/ Faculty of Humanities and Education[2], Department of English/ Faculty of Humanities and Education[3]

<*pep.weerawarna@gmail.com*>

Abstract-Colour Blindness (Colour Vision Deficiency) is a rare, inborn, genetic condition that deviates from the innate manner of seeing colours which can be a restriction for a person in his/her life standards. This research has analysed the significant difficulties faced by school children (age group of 13-16) with Colour Vision Deficiency in the Central Educational Zone of Colombo, Sri Lanka. On the other hand, several studies have addressed the difficulties of colour blindness; however, the challenges faced by Sri Lankan English language learning students remain to be accomplished. Therefore, this research aims to investigate the challenges encountered by English as a Second Language (ESL) learning students with colour blindness in their academic and daily endeavours. The objective of this study is to explore and reveal the concealed struggles of colour-blindness of students in their learning environment and daily basis. Furthermore, this research was conducted with a qualitative approach to explore the lived experiences of the interviewee. The data was collected through an in-depth interview, which examined one colour-blind secondary school student as a representative. The questions investigated how colour vision deficiency affects his educational, social, and psychological aspects. Most importantly, before the questions, a Colour Plate Test was conducted to identify the specific colour-blindness which was found as Red-green colour blindness (deuteranopia & protanopia). As a crucial finding, a lack of interest in tasks related colours in arts education and language learning was discovered. The empirical results portrayed that the colour blindness has affected a person's independence, preferences, desires, decision-making abilities, and enhancing their lifestyle. Moreover, difficulty in comprehending visual information and issues in reading textbooks, and handouts with coloured fonts were discovered. In summary, this research demonstrates the obstacles that a colour-blind individual can face.

Keywords: Challenges, Colour-blindness, English as a Second Language (ESL), Social, Psychological

A linguistic analysis on code mixed Television (TV) advertisements in Sri Lanka: In identifying code mixed language as a marketing strategy

A.U. Kottahachchi, B.A.S.S. Mendis, W.A.C. Ishara[#], W.A.P. Sandeepanie

Department of English Language Teaching – Faculty of Humanities

chamariwanniarachchi1998@gmail.com

Abstract-The mixing of two or more languages or language varieties in speech is known as code-mixing. This research was done to identify code mixing as a marketing tool in Sri Lanka. As for the methodology, 40 Sri Lankan television (TV) advertisements were selected including 20 code-mixed and non-code-mixed advertisements. A mixed approach has been used in the study to evaluate the progress of code-mixed TV advertisements compared to non-code-mixed TV advertisements. Moreover, a questionnaire was given to 20 participants covering the age groups of young adults and middle-aged adults. The questionnaire aimed to identify the most reached advertisements and the attitudes of the society towards the code-mixed language in the advertisements. The study was successful in determining the progress of code-mixed TV advertisements. Thus, such advertisements were analyzed according to the aspects of using the code-mixed language. The research findings claimed that code-mixed TV advertisements have been successful in promoting the brand names they represent compared to the non-code-mixed advertisements as code-mixed TV advertisements have directly addressed the concerns in promoting the products through a linguistic variation in speech. Moreover, the research has identified that the younger generation shows a positive attitude towards code-mixed TV advertisements compared to the old generation. Therefore, the research provides particular insights to the creators of the code-mixed advertisements in using the code-mixed language more systematically addressing the concerns of the target audience.

Keywords: Advertisements, Analysis, Code Mixing

Intelligent Course Suggestion System (ICST): A Case study of Students who Completed SLQF Level 1 to 4

D.M.S.M Dissanayaka[1], D.J.S De Silva[2], J.A.C.S Jayakodi[3], A.J Netthasinghe[4], W.D.D Udara[5], K.M.S.R Kirindigala[6], and Mr. M.D.S.N.Amarasiri[7]

Faculty of Humanities and Education, CINEC Campus, Sri Lanka

Sasikadissanayake26@gmail.com

Abstract—Data visualization and analysis is vital to organizations, including higher educational institutions. Hence, the organisations explore methods to utilize visualization techniques and systems in order to enhance the effectiveness of handling and understanding information. Higher educational institutions can leverage advanced data visualization techniques to enhance their reputation. Cutting-edge research and application of these techniques can attract top faculty, researchers, and students, solidifying the institution's position as a leader in education and research. However, it indicated there are very few higher education institutes using this technique and system. Hence objective of the study is to primarily investigate the information to have in the student data management system to provide comprehensive and accurate output to the user. This is a quantitative study and survey conducted in ABC higher education institute and sample size is 50 Bachelors of Education IT degree students randomly selected from batch 3 and 4. A questionnaire was distributed among 50 students. Respondents' ages varied from 21 to 24 years. According to the analysis it indicated that highest percentage (40%) of students was from Gampaha district and lowest percentages (2%) were are from Galle, Puttalam and Monaragala. When analysing visitors districts, it indicated that highest was 20% , from Gampaha district and lowest percentage of (2%) visitors , was from Galle, Puttalam , Monaragala, Ampara and Kurunegala districts. ICST can assist users of higher educational institutions to enlighten the students about the educational programs that they are eligible to follow based on their current educational qualifications which are aligned with Sri Lanka Qualification Framework (SLQF). Data visualization and analysis tool can change its content, appearance, and functionality in response to user input, system events, and information. Proposed course suggestion tool is to recommend higher study programs which the institution offers after analysing the data provided by the respective students. The discoveries yielded by this study hold potential significance for upcoming researchers intrigued by the domains of data science and data visualization.

Keywords: Data management, Data visualization, Analysis, Student data

Developing teaching techniques to enhance students' English performance

W. A. K. N. Lakshika[1]# R. M. J. P. Rathnayake[2]

[1]Department of Education, Faculty of humanities and Education, CINEC Campus, Malabe

[2] Department of Education, Faculty of humanities and Education, CINEC Campus, Malabe

<nadeeralakshika@gmail.com>

Abstract- Teaching techniques are the tools teachers use, acting as the means to impart knowledge to students. This study aims to propose a research-based solution to examine the effectiveness of English teachers' teaching techniques on the performance of ninth-grade students at ABC School in the Tangalle educational zone in the Southern Province. This study raises awareness of how English teachers' teaching techniques influence students' English performance. The objectives include expanding on the strengths and weaknesses of teaching techniques, identify how productive teaching techniques influence students' performance, explore the most effective teaching techniques for school, and recommending technological integrated teaching techniques as an effective approach for the English learning teaching process. The design of this study is scientific and comparative, primarily a mixed-mode study supplemented by both quantitative and qualitative data. Purposive sampling was used to select 50 grade nine students, two graduated English teachers, and two teaching techniques from ABC School. Data collection instruments included questionnaires, observation schedules, and a documentary review plan. This study revealed that increasing student engagement, introducing effective teaching techniques, and improving students' English performances are interconnected. Finally, the study concludes by stating that technology-integrated teaching techniques directly affect students' highest performance in the English learning teaching process.

Key words: Teaching techniques, Performance, Education

Challenges faced by 21st century school students: Students of secondary section at EFG school.

Taneesha Gamage

Department of Education, Faculty of Humanities and Education, Cinec campus, Malabe

taneeshapavani059@gmail.com

Abstract -In the 21st century, school students grapple with numerous challenges, prominently encompassing lack of awareness, deficiency in skill-based education, inadequate funds for higher education, and a dearth of professional clarity. These issues command central stage due to their prevalence in contemporary society and their adverse effects on students. The repercussions of such challenges include social anxiety, depression, low self-esteem, and pervasive loneliness among children, exacerbating their educational and mental well-being. Efforts are being made to mitigate these challenges in schools, yet proactive solutions and precautions appear lacking. Consequently, the objective of this study is to pinpoint effective interventions for these prevailing 21st-century challenges faced by students. The methodology employed involves a questionnaire administered to 40 secondary students at EFG School, with subsequent quantitative data analysis driving conclusions. Significantly, 40% of students advocate for enhanced parental and teacher involvement, underscoring the pivotal role of open dialogues in addressing these issues. 24% of students posit that awareness programs focused on these challenges could prove efficacious, revealing the potential impact of informed discourse. Notably, 20% suggest employing dramatizations to vividly depict the detrimental impact of these challenges on education and youthful psyche, indicating an innovative approach. Meanwhile, 16% accentuate the role of school policies as a solution to these quandaries, showcasing the importance of institutional support. In synthesis, active engagement between parents, teachers, and students emerges as a prime solution, echoing the significance of collaborative problem-solving. This study emphasizes that these challenges impede both scholastic and mental progression. Additionally, it underscores that the rectification of these challenges not only reclaims time for nurturing youthful aspirations but also engenders multifaceted advantages. As contemporary educational paradigms continue to evolve, addressing these challenges becomes paramount for fostering resilient and well-rounded individuals.

Key words - Challenges, Students, Education

An Investigation into the Factors Contributing to the Pronunciation Challenges Faced by Fifteen- to Sixteen -Year-Old students When Learning English as a Second Language, despite their Early Exposure to the English Language.

Lakshica Amaran#, Shenya Munasinghe, and Muthara Mandini

Department of Humanities and Education

lakshicaamaran@gmail.com

Abstract – Pronunciation plays an integral role in the process of learning a language. To attain the desired level of eloquence, one must effectively articulate and verbalize in the target language. However, in Sri Lanka, pronunciation and the practical usage of English have been neglected in English language teaching. This, in turn, has given rise to a plethora of difficulties among young speakers, regardless of their early exposure to English as a second language. This study aims to investigate students' difficulties in reaching the required level of fluency in speech in Sri Lankan English. To conduct this study, ten Tamil-dominant and ten Sinhala-dominant, fifteen to sixteen-year-old grade eleven students, from three different national schools were selected. They were surveyed by collecting voice recordings of students, as they orally dictated twelve different words provided by researchers and answered two research-related questions. These recordings were then compared to those of Standard Sri Lankan English (SSLE) speakers to reach the following conclusion. The preliminary findings revealed that pupils who pronounced words near the required eloquence level were from the suburbs and were aware of the distinctions in short and long vowel sounds in English. In contrast, the majority who struggled with pronunciation resided in rural areas and were unaware of the variations in vowel pronunciation. Furthermore, these findings also suggest that, despite having exposure to English as their second language before puberty, it is crucial for students to become aware of the required level of eloquence through a conscious learning process to avoid mispronunciation of words.

Keywords: Sri Lankan English, pronunciation, fluency, vowels, eloquence

Empowering Education and Bridging the Gap with the Comprehensive Free Online Platform for Programming Language Learning: A case study.

H.A.I. N Wijerathna[1], H.Y.M Pinto[2], W. R Alwis[3], D.M.S.M. Dissanayaka[4,] K.W.N.N. Ranthilaka[5]

Department of Education, Faculty of Humanities and Education, Cinec Campus, Sri Lanka

naveenhapuarachchi1111@gmail.com

Abstract-Online learning platforms revolutionize education, offering accessible, flexible, and diverse courses. Learners can acquire new skills and knowledge conveniently, making education a global pursuit. Even though numerous free learning platforms exist globally, our project originated from the challenge of lacking a platform to study computer programming in a manner that aligns with Sri Lanka's information and communication technology program recommendations. The "FOHE Learn" website is a creation of Bachelor of Education IT undergraduates in ABC Campus. The objective of the study is to serve as a comprehensive online platform for learning programming languages. It was a quantitative study and survey conducted using a questionnaire. Sample of the study is students in grades 6-13 in western province of Sri Lanka. Sample size is 50 students randomly selected. The study found that 96% were interested in a new online platform for learning programming languages. 94% of students preferred free, independent learning and 97% of students expressed a strong interest in pursuing higher education in IT and programming. The survey covered various age groups, with the majority in the 19 years or above age range (26%). Additionally, 78% of students had IT subjects in their curriculum, and 66% were not aware of free programming learning platforms. Students commonly desired programming languages included HTML, CSS, JavaScript, Python, and C++. Furthermore, according to a survey, 96% of students expressed their interest in learning if we were to develop a website offering free programming language resources. Overall, the survey indicates a significant demand for accessible programming education in Sri Lanka. By therefore, FOHE Learn is a free online platform that teaches programming languages like HTML, CSS, Python, and Pascal, targeting learners of all ages, including ordinary and advanced-level students and adults which empowers them with programming skills, known for user-friendliness, extensive language coverage, and connections to further education.

Keywords: Free online platform, programming language learning, independent learning

Examine Mental Health Issues Which Affect Students' Positive Behavior

S.M.C.N. Jayalath [1#], R.M.J.P. Rathnayake[2]

1 Department of Education, Faculty of humanities and Education, CINEC Campus, Malabe

2 Department of Education, Faculty of humanities and Education, CINEC Campus, Malabe

‹chamali19980711@gmail.com ›

Abstract- Mental health significantly impacts students' overall well-being, and issues like depression, stress, and anxiety can greatly affect their academic and personal lives. If teachers are unable to identify students' mental health issues, it can pose a threat to society. This survey research assessed the mental health issues of grade 7 students in the Kuliyapitiya education zone, specifically focusing on depression, anxiety, and stress levels. Utilizing a mixed-methods approach, the study collected quantitative data from the Depression, Anxiety, and Stress Scale (DASS-21) and qualitative insights from classroom observations and interviews involving 50 students, three teachers, and one parent. The findings revealed that 48% of students experienced "Normal" depression, 32% reported "Normal" anxiety, and 68% indicated "Normal" stress levels. Approximately 26% displayed "Mild" depression, 20% exhibited "Severe" anxiety and 16% experienced "Moderate" stress. These results underscore the need for targeted interventions to address mental health concerns among grade 7 students. In conclusion, the study emphasizes the importance of proactive measures to enhance students' well-being and academic success. Recommendations include prioritizing mental health education, accessible counseling services, mindfulness practices, and fostering positive peer support networks while involving parents in awareness programs to promote students' mental well-being within the educational setting. Teachers have a responsibility to produce good citizens to the society. For that, it is the responsibility and duty of the teachers to provide education to the students as well as to improve their knowledge, skills, and attitude as well as it is very important to build and maintain their mental and physical well-being.

Keywords: Mental health, well-being, depression