# SRI LANKA ASSOCIATION FOR ARTIFICIAL INTELLIGENCE

20th Annual Sessions

# 8th SLAAI - International Conference on Artificial Intelligence

(SLAAI-ICAI-2024)

18th -19th December 2024

General Sir John Kotelawala Defence University
Ratmalana
Sri Lanka

Sri Lanka Association for Artificial Intelligence – 2024

$8^{th}$ SLAAI International Conference on Artificial Intelligence

$18^{th}$- $19^{th}$ December 2024

Ratmalana,

Sri Lanka.



Editors:

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# -Agenda–

## $18^{\text{th}}$ December 2024

| Time | Event |
|---|---|
| 08:00 am | Welcoming Invitees |
| 08:30 am | KDU Anthem / Lightning of the Oil Lamp |
| 08:35 am | Welcome Dance |
| 08:45 am | Introduction to SLAAI Video |
| 08:50 am | Welcome Address by **Dr. B. Hettige**, President SLAAI |
| 09.00 am | Felicitation Ceremony - Founder Members of SLAAI |
| 09:20 am | Address by the Chief Guest<br>Deputy Vice Chancellor, **Major General Chinthaka Wickramasinghe** USP USACGSC, General Sir John Kotelawala Defence University |
| 09:30 am | Keynote Speech by **Snr. Prof. Asoka Karunananda**, University of Moratuwa |
| 09:55 am | Entertainment Item |
| 10:05 am | Keynote Speech by **Prof. Emi Yuda**, Mie University, Japan |
| 10:30 am | Vote of Thanks by **Dr. D.U. Vidanagama**, Conference Secretary |
| 10:40 am | National Anthem |
| 10:50 am | Refreshments |
| 11:30 am | Technical Sessions – 1 (Parallel Sessions 1 – 4) |
| 01:30 pm | Lunch |
| 02:30 pm | Technical Sessions – 2 (Parallel Sessions 1 – 4) |
| 05.00 pm | SLAAI AGM |

## -Message from SLAAI President –

With great pleasure and enthusiasm, I welcome you to the 8th SLAAI-International Conference on Artificial Intelligence – 2024 and the 20th Annual Sessions, hosted at the prestigious General Sir John Kotelawala Defence University (KDU). Together, we gather to explore and uncover the profound innovations that Aartificial Intelligence offers in advancing sustainable development.

SLAAI was formally established in the year 2000 as the successor to the Artificial Intelligence Research Group (AIRLK) in Sri Lanka. For over two decades, SLAAI has remained steadfast in its mission to increase public awareness of Artificial Intelligence, improve AI teaching and research, and foster partnerships between industry and academia to apply AI techniques to real-world challenges.

This year's theme, "Uncovering AI Innovations for Sustainable Development," underscores the transformative potential of AI in addressing some of the world's most pressing challenges. As we stand at the nexus of technological advancement and societal responsibility, this conference serves as a platform for meaningful discussions and innovative solutions that align technological progress with the global imperative for sustainability.

As we embark on this two-day intellectual journey, let us remember the significant responsibility that accompanies innovation. Our discussions and collaborations have the potential to create a lasting impact, shaping the trajectory of AI for generations to come. I encourage you to participate in this conference with a spirit of openness, cooperation, and shared commitment for utilizing AI as a force for good.

I extend my heartfelt gratitude to the Vice Chancellor of General

Sir John Kotelawala Defence University (KDU), the academic and non-academic staff of KDU, the organizing committee, sponsors, speakers, authors, and participants who have made this remarkable event possible. A special thanks to the council members of the IEEE Sri Lanka Chapter for their recognition and for granting IEEE indexing for SLAAI-ICAI-2024. Your dedication and contributions to advancing the dialogue on AI for sustainable development are invaluable to our collective mission.

As we come together in the spirit of exploration and collaboration, I encourage you to actively participate in the sessions, share your insights, and build connections that bridge disciplines and industries. Together, we can unlock the immense potential of AI to drive meaningful change.

May this conference inspire innovation, foster collaboration, and catalyze breakthroughs that guide us towards a more sustainable and inclusive world.

Thank you, and I wish you all a fruitful and enlightening 8th SLAAI-ICAI-2024.

**Dr. B Hettige**

**President/ Sri Lanka Association for Artificial Intelligence (SLAAI)**

**18.12.2024**

## - Message from Conference Chair-

I am delighted to welcome all participants and distinguished invitees to the 8th SLAAI-International Conference on Artificial Intelligence (SLAAI-ICAI 2024) and the 20th Annual Sessions of the Sri Lanka Association for Artificial Intelligence (SLAAI). Founded in the year 2000 as the successor to the AI Research Group in Sri Lanka (AIRLK), which had been active since 1998, SLAAI has consistently pursued its mission over the past 24 years. Our efforts have focused on: (1) Popularizing AI among the public, [2] Promoting AI education and research, and [3] Establishing industry-academia partnerships to leverage AI for social well-being.

SLAAI's collaboration with SLASSCOM, the apex body of Sri Lanka's software industry, has significantly advanced national-level AI initiatives and facilitated the sharing of global best practices in AI. SLAAI has also been an organizing partner of the Annual AI-Asia Summit with SLASSCOM since its inception. Our jointly organized AI Meetups with Virtusa (Pvt) Ltd have also become a popular platform for AI enthusiasts. SLAAI plays an active role in fostering academic awareness and engagement with AI across universities. Notable among our initiatives is the AI Awareness Workshop conducted for GCE (A/L) students, which highlighted Sri Lanka's first-ever BSc Hons in Artificial Intelligence degree program at the University of Moratuwa. SLAAI has also contributed to national policymaking as an active member of the Presidential Task Force for formulating the AI Policy Framework for Sri Lanka.

The SLAAI-International Conference on Artificial Intelligence (SLAAI-ICAI) has been our flagship annual event, serving as a platform for exchanging global knowledge and practices in AI

development. SLAAI-ICAI 2024 was technically co-sponsored by IEEE, and this year's conference continues the tradition with an impressive collection of research papers. Topics featured in SLAAI-ICAI 2024 include Machine Learning, Quantum Machine Learning, the Internet of Things (IoT), User Experience Engineering, Deep Learning, Natural Language Processing (NLP), Multi-Agent Systems, Ontological modeling, encompassing both symbolic and non-symbolic AI. SLAAI-ICAI received over 80 submissions this year, adhering to a rigorous double-blind peer-review process. Only 45% of submissions were accepted, ensuring the high quality of research presented. Abstracts of selected and presented papers will be published on the SLAAI website, while selected full papers will be indexed in IEEE Xplore. This year also marks SLAAI's 25th anniversary. To commemorate this milestone, the SLAAI Council has decided to honor the organization's founding members for their invaluable contributions.

As we celebrate this occasion, I extend my heartfelt gratitude to our technical co-sponsor, IEEE; our keynote speakers, session chairs, reviewers, authors, program committee, and SLAAI Council members. Your tireless efforts and dedication have made this event a resounding success, despite the challenges and uncertainties faced globally this year.

Warm regards,
**Professor Asoka Karunananda**
**Conference Chair, SLAAI-ICAI 2024**

**18/02/2024**

## - Message from Technical Programme Chair-

It is with great enthusiasm and anticipation that I welcome you to the 8th SLAAI-International Conference on Artificial Intelligence (SLAAI-ICAI 2024) and the 20th Annual Session of the Sri Lanka Association for Artificial Intelligence (SLAAI). This annual gathering continues to serve as a vibrant platform to explore and discuss groundbreaking innovations in Artificial Intelligence (AI) that contribute to sustainable development.

Since its establishment in the year 2000 as the successor to the Artificial Intelligence Research Group (AIRLK), SLAAI has been at the forefront of promoting AI in Sri Lanka. Over the past 24 years, we have tirelessly pursued our mission to increase public awareness of AI, enhance teaching and research in the field, and foster collaborations between academia and industry to address real-world challenges. Our initiatives include a wide range of activities such as seminars, workshops in schools and universities, industry meetups, and both local and international conferences.

The theme of this year's conference, "Uncovering AI Innovations for Sustainable Development," underscores the transformative potential of AI in addressing global challenges. From tackling climate change and optimizing resource management to revolutionizing healthcare and education, AI continues to unlock solutions that enhance the quality of life and promote equitable progress.

This year, the conference received an overwhelming response with 85 paper submissions, of which 45 were accepted after rigorous peer review. This acceptance rate reflects the high standard of research and innovation presented at SLAAI-ICAI 2024, highlighting the diversity and quality of contributions from

researchers worldwide.

As we embark on this intellectual journey, it is crucial to recognize the profound responsibility that accompanies innovation. The ideas and solutions discussed during this conference have the potential to shape not only the present but also the future, impacting generations to come. I encourage all participants to embrace this opportunity for collaboration, foster interdisciplinary dialogue, and contribute to a shared vision of leveraging AI for the greater good.

I extend my heartfelt gratitude to the Vice Chancellor of Kotelawala Defence University, the academic and non-academic staff, the organizing committee, sponsors, authors, speakers, and participants who have made this event possible. A special thanks to the IEEE Computer Society Sri Lankan Chapter for recognizing SLAAI-ICAI 2024 and granting IEEE indexing for our proceedings, further enhancing the conference's global reach and impact.

As we convene over the next two days, I invite you to engage actively in the sessions, share your expertise, and forge meaningful connections across diverse domains and industries. Together, let us catalyze innovations that pave the way toward a sustainable and inclusive future.

Thank you for being a part of this journey. I wish you a productive, insightful, and inspiring experience at the 8th SLAAI-ICAI 2024.

**Dr Thushari Silva**

**Technical Program Chair/SLAAI-ICAI 2024**

**18.12.2024**

## - Keynote Speech I -

# Using Artificial Intelligence to Address Singularity

Prof. Asoka Karunananda
Senior Professor, University of Moratuwa, Sri Lanka

Artificial intelligence (AI) is driven by the dual goal of understanding natural intelligence and building intelligent systems. While humanity continues to grapple with fully comprehending intelligence, AI has surpassed expectations in creating advanced intelligent machines. We now live in an era where AI-powered systems outperform humans in tasks constrained by biological limitations such as response time, accuracy, fatigue, and bias. AI also excels in exploring hazardous or inaccessible environments where limited data and knowledge challenge human intervention.

The defining trait of AI lies in its ability to combine power and control, enabling the creation of autonomous and self-organizing systems. While the autonomy of intelligent systems offers immense potential—such as self-driving vehicles and autonomous decision-making in critical scenarios—it also raises concerns about singularity. Singularity refers to a hypothetical point where AI surpasses human control and comprehension, potentially leading to unpredictable consequences.

Despite recognizing the advantages of autonomous systems in inaccessible or high-risk situations, many remain reluctant to grant machines full decision-making authority. This apprehension underscores the importance of human-centered AI, which emphasizes retaining human oversight in AI-driven decision-making. However, singularity is not merely a matter of human intervention. It also relates to the possibility of machines deceiving users. Generative AI models, such as ChatGPT, have demonstrated the ability to produce responses that can mislead or confuse individuals who lack expertise in the subject matter. Alan Turing, in his seminal 1950 paper Computing Machinery and Intelligence, anticipated this challenge, noting the need for careful scrutiny of intelligent systems.

To address singularity, human-centered AI must not only ensure transparency and accountability in machine decision-making but also guarantee that human users—particularly interrogators or decision-makers—possess adequate expertise. A complementary approach to mitigating singularity involves enhancing human cognitive capacities. In parallel with advancing machine intelligence, the AI community should invest in developing tools that augment human abilities, such as critical thinking, memory retention, imagination, and comprehension. By strengthening humanity's cognitive potential, we can ensure a symbiotic relationship between humans and machines, where human-centered AI becomes both safer and more productive. This dual-focus strategy—advancing both human and machine intelligence—could be key to addressing singularity responsibly.

**Prof. Asoka Karunananda:** Prof. Asoka Karunananda, a Senior Professor at the University of Moratuwa, is a renowned expert in Artificial Intelligence. He has played a pivotal role in advancing computing and AI education and research in Sri Lanka. As a founding member of the Sri Lanka Association for Artificial Intelligence (SLAAI), he has been instrumental in shaping the country's AI landscape.

In 2008, he introduced Sri Lanka's first MSc program in Artificial Intelligence, and a decade later, in 2018, he spearheaded the launch of the nation's first BSc Hons degree in AI. Over his 36-year academic career, Prof. Karunananda has supervised numerous PhD candidates and continues to mentor academic staff, postgraduate students, and undergraduates. His research interests encompass the theory of computing, multi-agent systems, ontological modeling, quantum machine learning, and mindfulness intervention in education.

## - Keynote Speech II -

# Safe Driving with Bio-Signal Processing and Machine Learning: Detecting Fatigue and Drowsiness by Non-invasive Monitoring and Body Pressure Distribution Analysis

Professor Emi Yuda
Mie University,Japan

Japan is facing a super-aging society and there is an urgent need to solve problems in traffic safety technology. In this talk, I will present our latest research on driver biological condition monitoring technology using bio-signal processing and machine learning. One is a technique for estimating drowsiness while driving in real time using a non-invasive measurement method and with minimal burden on the body. Previous studies have estimated sleepiness from heart rate indices and body surface temperature, but recently we have succeeded in estimating the state of falling asleep using only corrective acceleration.

The other achievement is based on multimodal time series analysis of body pressure distribution data and heart rate indices on a seat. Normally, in the correct human posture, the seat surface is evenly pressed by the two sciatic bones.

However, postural control becomes difficult due to fatigue caused by long hours of driving, and the fatigue state has been successfully estimated based on such physiological human characteristics.

These techniques have the potential to capture concentration tendencies and to comprehensively evaluate the health of drivers. This research is highly applicable to driver assistance systems and automatic driving technology, and may contribute to the reduction of traffic accidents and the realization of a comfortable driving environment.

**Professor Emi Yuda:** Professor Emi Yuda Professor (full) at Mie University, Japan. She is from Tokyo, Japan, and is currently a Professor of Innovation Center for Semiconductor and Digital Future (ICSDF) and

Graduate School of Engineering, Mie University, Japan. From 2019 to 2020, she was an Assistant Professor at the School of Engineering, Tohoku University, Japan and from 2021 to 2023, she was an Associate Professor at the Center for Data-driven Sciences and Artificial Intelligence (CDS), Tohoku University, Japan. Her research interests include bio-signal processing and biomedical big data analysis. She received her M.S. degree from the University of Tsukuba, Japan and Ph.D. degree from Nihon University, Japan and Doctor of Engineering (Dr. Eng.) Degree from Niigata University, Japan. She is also a senior member of IEEE.

# - Technical Sections -

**Technical Session 1: Parallel Session 1: Morning Session**

**Location:** FMSH Building, 5th floor Class A

**Time:** 11.30 am to 1.30 pm

**Session Chair:** Prof. Emi Yuda, Mie University, Japan

**Session Co-Chair:** Dr. Waruna Premachandra, BCI Campus, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T1P1.01 | 60 | 11.30 am - 11.50 am | **AI-Powered Student Learning System**<br>[1]Aneesah Sabar, [1]Sahan Gamage, [1]Abishek S., [1]Charuka Lakmal, [1]K.A. Dilini T. Kulawansa, [2]Pamoda Perera<br>*[1]University of Moratuwa, Sri Lanka*<br>*[2]Rootcode Colombo 03, Sri Lanka* |
| T1P1.02 | 49 | 11.50 am - 12.10 pm | **Knee Osteoarthritis Detection Using Machine Learning on Pre Processed X-ray Images and Treatment Recommendation**<br>[1]Nuha Rameez,[1]G.G. Dewmi Dissanayake, [1]G.A. Chanula Senindu, [1]P.M.H. Liyanage, [1]Vishmi Embuldeniya<br>*[1]Informatics Institute of Technology, Sri Lanka* |
| T1P1.03 | 51 | 12.10 pm - 12.30 pm | **A Review of Automated Bird Sound Recognition and Analysis in the New AI Era**<br>[1]Akila Mairthipala, [1]Samantha Mathara Arachchi, [1]Kasun Karunanayaka, [1]Ravindu Perera, [1,2]Pandula Pallewatta<br>*[1]University of Colombo School of Computing, Sri Lanka*<br>*[2]Nanjing University of Information Science and Technology, China* |
| T1P1.04 | 80 | 12.30 pm - 12.50 pm | **Enhancing Perception for Autonomous Driving Systems with Dual Vision Input Cycle GAN for Night-to-Day Image Translation**<br>[1]K.J.P. Fernando, [1]H.K.I.S. Lakmal, [2]M.B. Dissanayake, [3]L.P. Kalansooriya<br>*[1]NSBM Green University, Homagama, Sri Lanka*<br>*[2]University of Peradeniya, Sri Lanka*<br>*[3]General Sir John Kotelawala Defence University, Sri Lanka* |
| T1P1.05 | 70 | 12.50 pm - 1.10 pm | **Enhancing Financial Risk Management with Federated AI**<br>[1]Vineet Dhanawat, [2]Varun Shinde, [3]Vishal Karande, [1]Kartik Singhal<br>*[1]Meta Platforms Inc, Menlo Park, US*<br>*[2]Cloudera Inc, Austin, US*<br>*[3]Google Inc, Mountain View, US* |
| T1P1.06 | 17 | 1.10 pm – 1.30 pm | **Cluster-Based Time Series Modelling and Forecasting of Mobile Network Traffic**<br>[1]Vigneshwaran Palanisamy, [2]Charles Joseph<br>*[1]Sabaragamuwa University of Sri Lanka*<br>*[2]University of Southern Queensland Springfield, Australia* |

**Technical Session 1: Parallel Session 2: Morning Session**

**Location:** FMSH Building, 4th floor Class C

**Time:** 11.30 am to 1.30 pm

**Session Chair:** Prof. T.G.I. Fernando, University of Sri Jayawardenapura, Sri Lanka

**Session Co-Chair:** Dr. W.M.K.S. Ilmini, University of Sri Jayawardenapura, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T1P2.01 | 28 | 11.30 am - 11.50 am | **A Promptable Segmentation Approach to Automatic Floor Plan Analysis using Vision Transformers**<br>[1]M.D.P.P. Goonathilake, [2]A.L.A.R.R. Thanuja<br>*[1]University of Moratuwa, Sri Lanka*<br>*[2]University of North Carolina, USA* |
| T1P2.02 | 04 | 11.50 am - 12.10 pm | **Enhancing Small Dataset Classification using Projected Quantum Kernels with Convolutional Neural Networks**<br>[1]A.M.A.S.D. Alagiyawanna, [1]Asoka Karunananda, [2]A. Mahasinghe, [1]Thushari Silva<br>*[1]University of Moratuwa, Sri Lanka*<br>*[2]University of Colombo, Sri Lanka* |
| T1P2.03 | 40 | 12.10 pm - 12.30 pm | **Dynamic Ontology-Based Travel Recommendation System**<br>[1]Hansika Gunasekara, [1]Thushari Silva<br>*[1]University of Moratuwa, Sri Lanka* |
| T1P2.04 | 77 | 12.30 pm - 12.50 pm | **Evaluating the Features of Indoor Positioning Systems Using Explainable AI**<br>[1]S.A.K. Dhananjaya, [1]H.K.I.S. Lakmal, [1]W.C. Nirmal<br>*[1]NSBM Green University, Homagama, Sri Lanka* |
| T1P2.05 | 79 | 12.50 pm - 1.10 pm | **Exploring Mind Models: A Comparative Study as the Inaugural Step towards Consciousness Chatbots**<br>[1]D.K.D.K. Amarasinghe, [1]B. Hettige<br>*[1]General Sir John Kotelawala Defence University, Sri Lanka* |

**Technical Session 1: Parallel Session 3: Morning Session**

**Location:** FMSH Building, 5th floor Class B

**Time:** 11.30 am to 1.30 pm

**Session Chair:** Dr. Ruwan Weerasinghe , Informatics Institute of Technology, Sri Lanka

**Session Co-Chair:** Ms. W.J. Samaraweera, Gen. Sir John Kotelawala Defence University, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T1P3.01 | 72 | 11.30 am - 11.50 am | **Multi-Agent Reinforcement Learning based Warehouse Task Assignment**<br>[1]Ashan Priyadarshana Kuruppu, [1]Asoka S. Karunananda<br>[1]*University of Moratuwa, Sri Lanka* |
| T1P3.02 | 10 | 11.50 am - 12.10 pm | **Cross-Platform Topic Analysis: Identifying Trends and Divergences in Social Media Discourse**<br>[1]Amila Chethana Nanayakkara, [1]Banage T.G.S. Kumara, [1]R.M.K.T. Rathnayaka<br>[1]*Sabaragamuwa University of Sri Lanka* |
| T1P3.03 | 26 | 12.10 pm - 12.30 pm | **Implementing Cognitive Behavioral Therapy in Chatbots to Reduce Students' Exam Stress Using ChatGPT**<br>[1]M.M.A.H. Indumini, [1]K.A.S.H. Kulathilake, [1]D.K. Hettiarachchi<br>[1]*Rajarata University of Sri Lanka* |
| T1P3.04 | 67 | 12.30 pm - 12.50 pm | **Data Driven Analysis of Protest Dynamics: Comparing Black Lives Matter Movement 2020 and South African Unrest 2021 on Twitter**<br>[1]Amila Chethana Nanayakkara, 1Banage T.G.S. Kumara, [1]R.M. Kapila Tharanga Rathnayaka |
| T1P3.05 | 66 | 12.50 pm - 1.10 pm | **Comparative Analysis of Deep Learning Models for Multilingual Language Translation**<br>[1]Divya Nimma, [2]V.K. Somasekhar Srinivas, [3]Santoshi Sen Gupta, [4]Hari Nair, [5]R.Latha Devi, [6]B.Kiran Bala<br>[1]*University of Southern Mississippi, USA*<br>[2]*Mohan Babu University, India*<br>[3]*Graphic Era Hill University, India*<br>[4]*Sagi Rama Krishnam Raju Engineering College, India*<br>[5]*University College of Engineering, India*<br>[6]*K. Ramakrishnan College of Engineering, India* |

**Technical Session 1: Parallel Session 4: Morning Session**

**Location:** FMSH Building, 4th floor Class D

**Time:** 11.30 am to 1.30 pm

**Session Chair:** Dr. A.T.P. Silva, University of Moratuwa, Sri Lanka

**Session Co-Chair:** Ms. S.C.M. De Silva Sirisooriya, Gen. Sir John Kotelawala Defence University, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T1P4.01 | 37 | 11.30 am - 11.50 am | **Review on AI Assistant Systems for Programming Language Learning in Learning Environments**<br>[1]Savithree Senanayake, [1]Kasun Karunanayaka, [2]K.V.J.P. Ekanayake<br>*[1]University of Colombo, Sri Lanka*<br>*[2]The Open University of Sri Lanka, Nugegoda, Sri Lanka* |
| T1P4.02 | 50 | 11.50 am - 12.10 pm | **Advancing Demand Forecasting for Material Requirements Planning in Food Manufacturing: A Hierarchical Forecasting Approach**<br>[1]Achala Hasini Perera, [1]H. Niles Perera, [1]Priyanga Dilini Talagala, [1]Amila Thibbotuwawa<br>*[1]University of Moratuwa, Sri Lanka*<br>*[1]Sabaragamuwa University of Sri Lanka* |
| T1P4.03 | 99 | 12.10 pm - 12.30 pm | **Sentiment Analysis with Support Vector Machines for Travel Agency Ranking and Traveler Decision Support in Sri Lanka**<br>[1]D.D.M. Jayawardana, [1]G.S.N. Meedin, [1]H.U.W. Rathnayake<br>*[1]The Open University of Sri Lanka* |
| T1P4.04 | 108 | 12.30 pm - 12.50 pm | **A Novel Stacked Machine Learning Framework for Enhanced Prediction of Corporate CO2 Emissions in Multisectoral Analysis**<br>[1]K.N.M.P.K. Kosgahakumbura, [1]P.P.N.V. Kumara, [1]S.M.M. Lakmali<br>*[1]General Sir John Kotelawala Defence University, Sri Lanka* |
| T2P4.05 | 93 | 12.50 pm – 1.10 pm | **1D CNN-Based Traditional Instrument Classification and Notation Generation in Sinhala for Gataberaya and Flute**<br>[1]P.G.R. Dulmi, [1]B. Hettige<br>*[1]General Sir John Kotelawala Defence University, Sri Lanka* |

**Technical Session 2: Parallel Session 1: Evening Session**

**Location:** FMSH Building, 5th floor Class A

**Time:** 02.30 pm to 04.30 pm

**Session Chair:**Prof. R.M.K.T. Rathnayake, Sabaragamuwa University of Sri Lanka, Sri Lanka

**Session Co-Chair:**Ms. R.G.U.I. Meththananda, Gen. Sir John Kotelawala Defence University, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T2P1.01 | 16 | 2.30 pm – 2.50 pm | **Optimizing Feature Selection in Spam Email Detection Using Co-Evolutionary Algorithms**<br>[1]Nethni Hirusha Wanigasingha, [1]T.G.I. Fernando<br>[1]*University of Sri Jayewardenepura, Sri Lanka* |
| T2P1.02 | 32 | 2.50 pm – 3.10 pm | **2D AI Avatar Attributes Impacting on Bank Customers' Perceived Experience**<br>[1]Surasi Muthumini De Silva, [1]Imesha Imangi, [1]Supun Lakshan, [2]H.A. Dimuthu Maduranga Arachchi, [1]G.D. Samarasinghe<br>[1]*University of Moratuwa, Sri Lanka*<br>[2]*Toulouse Capitole Université, France* |
| T2P1.03 | 46 | 3.10 pm – 3.30 pm | **Analyze Factors Affecting Thread Consumption in a Garment and Develop a Machine Learning-based Prediction Model**<br>[1]Vindya Ubayawickrema, [1]Samantha Mathara Arachchi, [1,2]Pandula Pallewatta, [1]Kasun Karunanayaka, [1]Akila Maithripala<br>[1]*University of Colombo School of Computing, Sri Lanka*<br>[2]*Nanjing University of Information Science and Technology, China* |
| T2P1.04 | 48 | 3.30 pm - 3.50 pm | **LawKey – Law Constitution Chatbot**<br>[1]W. Shamini Fernando, [1]Mandinu Handapangoda, [1]Nividula Samindi, [1]Maneth Gamage, [1]Dileeka Alwis<br>[1]*Informatics Institute of Technology, Sri Lanka* |
| T2P1.05 | 18 | 3.50 pm – 4.10 pm | **Comparative Performance Analysis of Machine Learning Models for Breast Cancer Prediction**<br>[1]H.A. Dimuthu Maduranga Arachchi, [2]Amila Samarasinghe, [3]H.P. Dimuth Prasanna Pathirana, [4]G.D. Samarasinghe<br>[1]*Toulouse Capitole Université, France*<br>[2]*Individual Researcher, Kandy, Sri Lanka*<br>[3]*Uva Wellassa University, Sri Lanka*<br>[4]*University of Moratuwa, Sri Lanka* |
| T2P1.06 | 03 | 4.10 pm – 4.30 pm | **A Fully Automated Approach for Enhancing Ancient Tamil Inscriptions Using Deep Learning**<br>[1]Suthakar Sivashanth,[1]Eugene Yugarajah Andrew Charles, [1]Siyamalan Manivannan<br>[1]*University of Jaffna, Sri Lanka* |

**Technical Session 2: Parallel Session 2: Evening Session**

**Location:** FMSH Building, 4th floor Class C

**Time:** 02.30 pm to 04.30 pm

**Session Chair:** Dr. Sidath Liyanage, University of Kelaniya, Sri Lanka Session

**Session Co-Chair:** Ms. M.K.P. Madushanka, Gen. Sir John Kotelawala Defence University, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T2P2.01 | 52 | 2.30 pm – 2.50 pm | **Development of a Computationally Efficient CNN-Based Deep Learning Model for Anomaly Detection in Retail Surveillance**<br>[1]Lavanya Ravichandran, [1]Fathima Riztha, [1]Thakshanah Selvakumar, [1]Zamith Ahamed<br>*[1]University of Kelaniya, Sri Lanka* |
| T2P2.02 | 09 | 2.50 pm – 3.10 pm | **Hybrid Machine Learning and Moving Target Defense (MTD) for Comprehensive Switchport Attack Detection**<br>[1]R.G.C. Upeksha, [1]M.W.P. Maduranga, [2]Chanaka Lasantha, [1]Sharith Aminda<br>*[1]SLTC Campus, Sri Lanka*<br>*[2]Kerner Norland Pvt (Ltd), Sri Lanka* |
| T2P2.03 | 96 | 3.10 pm – 3.30 pm | **PaddyShield: A CNN-Based Rice Leaf Diseases Detection and Management System**<br>[1]Shalika Chathuranga, [1]Pavithra Subhashini, [2]Jeeva Ekanayake<br>*[1]NSBM Green University, Colombo, Sri Lanka*<br>*[2]The Open University of Sri Lanka, Nawala, Sri Lanka* |
| T2P2.04 | 47 | 3.30 pm – 3.50 pm | **Optimizing Production Efficiency in the Garment Industry: The Role of Predictive Analytics Techniques in Sri Lanka's Textile Sector**<br>[1]Zamith Ahamed, 1Dinesh Asanka, [1]Chathura Rajapakse<br>*[1]University of Kelaniya, Sri Lanka* |
| T2P2.05 | 11 | 3.50 pm – 4.10 pm | **Udarata Dance Pose Detection and Validation Using Computer Vision and Deep Neural Networks: A Comparative Study of Static and Dynamic Approaches**<br>[1]S.D.T. Akalanka Siriwardana, [2]MWP Maduranga<br>*[1]General Sir John Kotelawala Defence University, Sri Lanka*<br>*[2]Centre for Telecommunications Research, Sri Lanka Technology Campus, Sri Lanka* |

**Technical Session 2: Parallel Session 3: Evening Session**

**Location:** FMSH Building, 5th floor Class C

**Time:** 02.30 pm to 04.30 pm

**Session Chair:** Prof. H.U.W. Rathnayake, The Open University of Sri Lanka, Sri Lanka

**Session Co-Chair:** Dr. P.T.R. Dabare, The Open University of Sri Lanka, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T2P3.01 | 24 | 2.30 pm – 2.50 pm | **Nutrient Deficiency Detection System for Black Pepper Leaf Using Machine Learning**<br>[1]A.M.S.K. Abeysinghe, [1]G. Anthonys<br>*[1]The Open University of Sri Lanka, Nawala, Sri Lanka* |
| T2P3.02 | 30 | 2.50 pm – 3.10 pm | **Automated Algae Detection and Quantification on Coral Reefs Using U-Net Segmentation Model**<br>[1]S.M.H.M. Samarakoon, [1]B.K.K.S. Rodrigo, [1]N.P.U.N. Pathirana, [1]M.N.F. Nifra, [1]M.N.R. Begum, [1]K.A.S.H. Kulathilake<br>*[1]Rajarata University of Sri Lanka, Sri Lanka* |
| T2P3.03 | 61 | 3.10 pm – 3.30 pm | **Quality Assurance for LLM-Generated Test Cases: A Systematic Literature Review**<br>[1]Hasali Edirisinghe, [1]Dilani Wickramaarachchi<br>*[1]University of Kelaniya, Sri Lanka* |
| T2P3.04 | 86 | 3.30 pm – 3.50 pm | **IoT-Enabled Dual-Sensing Smart Waste Management System: Enhancing Urban Cleanliness and Sustainability in Smart Cities**<br>[1]R.M.P.M.D. Rathnayke, [2]T.M.M. Chanaka, [1]P.T.R. Dabare, [3]K.P. Hewagamage<br>*[1]The Open University of Sri Lanka, Nawala, Sri Lanka, [2]NMI Communications, AIRTEL Maintenance, [3]University of Colombo, Sri Lanka* |
| T2P3.05 | 57 | 3.50 pm – 4.10 pm | **Development of a Real-Time Hand Gesture Recognition System for Aid of Hearing-Impaired Communication Using Flex Sensors and Machine Learning Algorithms**<br>[1]Chamod Rathnayake, [1]Rukshan Gamage, [1]Ruwan Kalubowila, [1]B.L. Sanjaya Thilakarathne<br>*[1]University of Colombo, Sri Lanka* |

**Technical Session 2: Parallel Session 4: Evening Session**

**Location:** FMSH Building, 4th floor Class D

**Time:** 02.30 pm to 04.30 pm

**Session Chair:** Dr. Shanika Wijayasekara, Sri Lanka Institute of Information Technology, Sri Lanka

**Session Co-Chair:** Ms. L.T.T.D. Silva, Gen. Sir John Kotelawala Defence University, Sri Lanka

| Session ID | Paper ID | Time (SL Time) | Paper Title and Authors |
|---|---|---|---|
| T2P4.01 | 29 | 2.30 pm - 2.50 pm | **Handling Data Imbalance in Video Satisfaction Analysis**<br>[1]P.D. Thimira Madusanka, [1]U.A. Piumi Ishanka<br>*[1]Sabaragamuwa University of Sri Lanka* |
| T2P4.02 | 25 | 2.50 pm – 3.10 pm | **Enhanced Failure Detection in Induction Motors Using Supervised Learning and Data Smoothing Techniques**<br>[1]W.C. Nirmal, [1]H.K.I.S. Lakmal, [1]S.A.K. Dhananjaya<br>*[1]NSBM Green University, Homagama, Sri Lanka* |
| T2P4.03 | 63 | 3.10 pm – 3.30 pm | **RSSI-Based Indoor Localization Using Deep Learning with Custom Loss Function**<br>[1]M.W.P. Maduranga, [1]Udesh Oruthota, [2]H.K.I.S. Lakmal, [2]Shamila Kulatunga<br>*[1]Sri Lanka Technology Campus, Sri Lanka, [2]NSBM Green University, Homagama, Sri Lanka* |
| T2P4.04 | 71 | 3.30 pm – 3.50 pm | **Performance Comparison of Machine Learning Approaches for Predicting Wind Power Generation of Thambapavani Wind Farm in Sri Lanka**<br>[1]W.M.S.K. Kumari, [1]N. Yapage<br>*[1]University of Ruhuna, Sri Lanka* |
| T1P4.05 | 109 | 3.50 pm - 4.10 pm | **Real Time Energy Forecasting Scheme for Large-Scale PV Solar Power Plants - Cloud Image Segmentation and Contour Detection**<br>[1]K.H.R.P. Hewage, [1]Udaya Dampage, [1]E.R.C. Sandamali<br>*[1]General Sir John Kotelawala Defence University, Sri Lanka* |

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Date : 19th of December 2024

Venue : via Zoom

Link: : Meeting ID: 921 1855 3621 Passcode: Slaai@2024

| **Time** | **Topic** | **Resource Person** |
|---|---|---|
| 8.30 AM – 9.00 AM | Introduction to Workshop | Dr. B. Hettige, President SLAAI |
| 9.00 AM – 10.00 AM | Generative AI | Prof. Roshan Ragel<br>Consulting CEO – Lanka Research and Education Network (LEARN)<br>Head – Department of Computer Engineering<br>Faculty of Engineering<br>University of Peradeniya, Sri Lanka |
| 10.00 AM – 11.00 AM | NLP & Applications | Eng. Dinesh Asanka<br>Senior Lecturer<br>Department of Industrial Management<br>University of Kelaniya, Sri Lanka |
| 11.00 AM | Vote of Thanks | Dr. D. U. Vidanagama, Secretary SLAAI |

# $8^{th}$ SLAAI - International Conference on Artificial Intelligence

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