6TH IEEE INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE IN ENGINEERING AND TECHNOLOGY

IICAIET 2024

26-28 August 2024
Kota Kinabalu, Malaysia

Organised by:

IEEE

UMS
UNIVERSITI MALAYSIA SABAH

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About IICAIET

IEEE International Conference on Artificial Intelligence in Engineering and Technology (IICAIET) is the annual flagship technical event of IEEE Sabah Subsection. The IICAIET conference series has gained great interests from scholars, researchers, academicians, professionals, and students in the Asia-Pacific Region, covering all over technical areas related to Artificial Intelligence.

The first ICAIET conference goes 20 years back to 2002, held in Kota Kinabalu, co-organized by Universiti Malaysia Sabah (UMS) and the Artificial Intelligence Research Unit (AiRU). ICAIET was subsequently held biannually in 2004 and 2006. Significant scientific findings towards the trend of Artificial Intelligence were presented by international and local participants who have attended ICAIET. The reviewed papers presented at the conference were then published as proceedings.

With the establishment of the IEEE Sabah Subsection in 2018, ICAIET was then rebranded as IICAIET with IEEE sponsorship. IICAIET was subsequently held in 2020 before changing into annual event in 2021. With the technical sponsorship of IEEE Sabah Subsection, the conference proceeding for IICAIET 2018, IICAIET 2020, IICAIET 2021, IICAIET 2022 and IICAIET 2023 were published in IEEE Xplore and Scopus-indexed.

This year, IICAIET 2024 received 325 submissions. Upon review of all the submissions, 125 accepted papers will be presented orally during the conference, both in person and online.

We are proud to that IICAIET has become an important platform to exchange and discuss the new ideas, opinions, and prospects in Artificial Intelligence.

To learn more about IICAIET, visit our website: iicaiet.ieeesabah.org

Message from Chair

It is my great honor to welcome you to the 6th IEEE International Conference on Artificial Intelligence in Engineering and Technology 2024, IICAIET 2024.

Welcome to IICAIET 2024, and welcome to Sabah, the land below the wind!

This year, we are excited to host a hybrid conference format, marking our continued commitment to inclusivity and global collaboration. Over the next three days, we will engage in two days of in-person interactions here in Sabah, followed by a day of online sessions, ensuring that participants from around the world can join us regardless of location.

Artificial Intelligence continues to be at the forefront of technological innovation, shaping industries and society alike. As AI rapidly evolves, so too does the dialogue surrounding its impact. This year's conference will delve deeply into these discussions, focusing on how AI is redefining our world and the ethical considerations that must guide its development.

We are proud to share that this year's conference has received an overwhelming response, with 325 submissions from across the globe, including contributions from Australia, Sweden, Turkey, South Korea, Japan, China, Fiji, Thailand, Philippines, Madagascar, Sri Lanka, Pakistan, Bangladesh, India, Canada, the USA, the UK, and Malaysia, among others. After a rigorous review process, we are pleased to present 125 papers that meet the high standards of IICAIET 2024.

On behalf of the organizing committee, I hope this conference serves as a valuable platform for meaningful engagement and fruitful discussions. Whether you are attending in person or online, your participation is crucial in advancing the field of Artificial Intelligence.

Thank you for your involvement in IICAIET 2024.

Dr. Rosalyn R Porle
Conference Chair
IICAIET 2024

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Assoc. Prof. Dr. Jamal Dargham, Universiti Malaysia Sabah

Keynote Talks

Machine Learning Methods for Trustworthy Autonomous Systems

Professor Lyudmila Mihaylova

The University of Sheffield, United Kingdom

There is a fast development of different machine learning methods – for object classification, tracking, action recognition and other tasks with multiple types of data – from images and videos to data from wireless sensor networks. Autonomous image and video analytics faces a number of challenges due to the huge volumes of data that sensors provide, the changeable environmental conditions and other factors. However, it is important to know when the methods work well and when they are not reliable, e.g. how much could we trust the obtained results? How could we characterise trust is a related question. How could we quantify the impact of uncertainties on the developed solutions? This talk will discuss current trends in the area of machine learning and show results for image and video analytics for autonomous systems.

This talk will present recent results on automated behaviour analysis for decision making. Recent results for automated video analytics will be presented with Gaussian process methods, deep learning and other methods. Their pros and cons will be discussed. Some of these results are part of Digital twins, recently developed new tools that incorporate machine learning and artificial intelligence methods. This talk will discuss the big potential of Digital Twins, the opportunities and challenges that they bring.

LYUDMILA MIHAYLOVA is Professor of Signal Processing and Control in the Department of Automatic Control and Systems Engineering at the University of Sheffield, Sheffield, United Kingdom.

Her research interests are in the areas of trustworthy autonomous systems with applications to smart cities, sensor networks, digital health and others. She has expertise in the areas of machine learning, intelligent sensing and sensor data fusion. She won the Tammy Blair best award from the International Conference of Information Fusion 2017, best paper awards from the IEEE DESSERT'2019, 17th IEEE SPA'2013 Conference and IEEE Sensor Data Fusion Workshop, 2013.

Prof. Mihaylova has published more than 200 scientific papers in peer reviewed international journals such as IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on Signal Processing, Automatica, IEEE Transactions on Industrial informatics and in a number of conferences. She has more than 6200 citations on google scholar.

Feature Engineering: The Impact on Artificial Intelligence Model Performance

Assoc. Prof. Ts. Dr. Mohd Hanafi bin Ahmad Hijazi

Universiti Malaysia Sabah, Malaysia

Feature engineering is a crucial component of AI model development, significantly impacting performance, interpretability, and scalability. There are two types of feature engineering, the traditional and automated feature engineering, each has its own strengths and challenges. In order to improve model accuracy and interpretability, traditional feature engineering manually selects and creates features using domain expertise. However, it is time-consuming and might not work well with large, complex datasets. In contrast, automated feature engineering is scalable and efficient, sometimes at the expense of interpretability, since it uses sophisticated algorithms and tools to rapidly generate and refine features. Various techniques, including domain knowledge-based features and statistical features, are discussed. The advantages of feature engineering are demonstrated by case studies that include from the fields of security, healthcare, and natural language processing. Although there are still issues with scalability, the need for domain expertise, and overfitting, feature engineering is progressing and paving the way to more effective methods that drive innovations in AI model accuracy and applicability.

MOHD HANAFI AHMAD HIJAZI (M'14) received the B.Sc. and M.Sc. degrees in computer science at the Universiti Teknologi Malaysia, in 2001 and 2005 and the Ph.D. degree in computer science from the University of Liverpool, United Kingdom, in 2012. From 2012 to 2018 he was a Senior Lecturer with the Faculty of Computing and Informatics, Universiti Malaysia Sabah. Since 2018, he has been an Associate Professor at the same Faculty. Currently, he is the Dean of the Faculty and the Head of Data Technology and Applications Research Group. His research interest includes data mining and artificial intelligence with the application on healthcare and biometrics. Dr. Hijazi is also a professional member of Malaysia Board of Technologist (MBOT) and has several times been appointed as auditor/ lead auditor for the accreditation of IT programmes under the MBOT.

AI-Driven R&D: Catalyzing Malaysia's Leadership in the Global Electrical & Electronics Industry

Ir. Dr. Nordin Ramli

MIMOS, Malaysia & IEEE Malaysia Section

This talk will delve into the pivotal role of AI-driven R&D in propelling Malaysia's E&E industry to new heights, reinforcing its status as the backbone of the nation's technological and economic advancement. By exploring the revolutionary impact of AI on semiconductor design, manufacturing processes, and product development, we will illuminate how AI is not just reshaping but redefining the landscape of the E&E sector.

The presentation will provide a comprehensive overview of strategic R&D approaches that are crucial for harnessing AI's full potential. Emphasizing the critical importance of industry-academia collaboration, robust government support, and the cultivation of AI expertise within the sector, we will outline a roadmap for integrating AI into traditional R&D workflows. Addressing challenges such as data management, ethical considerations, and regulatory compliance, we will offer practical solutions designed to overcome these barriers, ensuring that AI integration is both effective and sustainable.

Highlighting case studies and success stories, particularly those pioneered by MIMOS Berhad, Malaysia's national research center for E&E, we will demonstrate the tangible benefits of AI in E&E R&D. These examples will showcase AI's significant contributions to product innovation, market readiness, and quality enhancement, underscoring Malaysia's potential to lead in the global E&E industry. As we explore emerging trends and future opportunities, the talk will position Malaysia at the forefront of AI-driven advancements, charting a course for continued leadership in the global E&E sector.

NORDIN RAMLI is a distinguished leader with a 24-year career in engineering, technology, and innovation. As Head of Technology Advisory at MIMOS Berhad, the public R&D Institute, he has driven significant revenue growth and enhanced operational efficiency through successful R&D strategies and large-scale projects in renewable energy, smart mobility, blockchain, IoT, and AI. Nordin's expertise extends to emerging technologies, evidenced by his publications and patents in wireless communications.

He holds an MBA from Putra Business School and has established strategic partnerships with industry leaders, academic institutions, and research organizations. Nordin oversees seven RMKe-12 programs and 13 Strategic Research Funding projects, totaling RM254 million in funding, and is committed to driving global innovation and research excellence.

Currently, Nordin is the Chair of IEEE Malaysia Section (2023-2024) and has been recognized as a Fellow of the Academy of Sciences, Top Research Scientist Malaysia, and Young Scientist Network member. He has played a key role in organizing global IEEE conferences, including ICC2016, VTC2019-Spring, and GLOBECOM2023, and has served in various leadership positions within IEEE. Nordin is also an Adjunct Professor at Universiti Teknologi Malaysia and Universiti Malaysia Terengganu, and a registered professional engineer and technologist in Malaysia.

Conference Program

Day 1

26 August 2024 (Monday)	
08:00 - 09:00	Registration
09:00 - 09:30	IICAIET 2024 Opening Ceremony
9:30 - 10:00	Tea Break & Networking
10:00 - 11:15	Technical Session A A1: Image Processing and Object Detection A2: Data-Driven Anomaly Detection and Monitoring
11:15 - 11:30	Tea Break
11:30 - 12:30	Keynote 1: Ir. Dr. Nordin Ramli *MIMOS, Malaysia & IEEE Malaysia Section* *Title: AI-Driven R&D: Catalyzing Malaysia's Leadership in the Global Electrical & Electronics Industry*
12:30 - 14:00	Lunch
14:00 - 15:00	Technical Session B B1: AI in Transportation and Navigation B2: Forecasting and Predictive Models
15:00 - 15:15	Tea Break
15:15 - 16:15	Technical Session C C1: Cryptography and Security C2: Optimisation Strategies
16:15 - 16:30	Short Break
16:30 - 17:30	Keynote 2: Prof. Lyudmila Mihaylova *University of Sheffield, United Kingdom* *Title: Machine Learning Methods for Trustworthy Autonomous Systems*

* Please note that the time stated in the table uses MYT (GMT +8).

Conference Program

Day 2

27 August 2024 (Tuesday)	
08:00 - 09:00	Registration
09:00 - 10:00	Keynote 3: Assoc. Prof. Ts. Dr. Mohd. Hanafi bin Ahmad Hijazi *University Malaysia Sabah, Malaysia* *Title: Feature Engineering: The Impact on Artificial Intelligence Model Performance*
10:00 - 10:15	Tea Break
10:15 - 11:15	Technical Session D D1: AI in Medical and Healthcare
11:15 - 11:30	Short Break
11:30 - 12:30	Technical Session E E1: AI-Enhanced Control and Inspection
12:30 - 14:00	Lunch
14:00 - 15:00	Technical Session F F1: AI in Network and Localisation Systems
15:00 - 15:15	Tea Break
15:15 - 16:30	Technical Session G G1: AI Innovations in Diverse Domains

* Please note that the time stated in the table uses MYT (GMT +8).

Conference Program

Day 3

28 August 2024 (Wednesday)	
08:00 - 09:00	Registration
09:00 - 10:30	Technical Session H H1: Agricultural Disease Detection H2: Human Motion Analysis H3: Disease Detection and Diagnosis Techniques H4: Agriculture and Plant Classification
10:30 - 10:45	Short Break
10:45 - 12:30	Technical Session I I1: Emotion and Mental Health Analysis I2: Visual Recognition and Classification Systems I3: Predictive Analytics and Models I4: Metaheuristics and Model Optimisation
12:30 - 14:00	Lunch
14:00 - 15:15	Technical Session J J1: Traffic and Communication Systems J2: Signal Processing and Recognition Applications J3: System Control and Fault Detection J4: Food and Agricultural Product Assessment
15:15 - 15:30	Tea Break
15:30 - 17:00	Technical Session K K1: Environmental and Ecological Monitoring K2: Healthcare Applications and Technologies K3: Industrial and Mechanical Systems K4: Security and Surveillance

* Please note that the time stated in the table uses MYT (GMT +8).

Technical Program
Parallel Session A

A1: Image Processing and Object Detection	
Session Chair: Dr. Rosalyn R Porle	
Paper ID	Paper Title
59	Development of a Baybayin Words Recognition System Using Support Vector Machine *Kyeong Nan C. Gim, Fiona S. Nabua and Meo Vincent C. Caya*
172	An Efficient Intersection Over Union Algorithm with Angle Orientation for an Improved 3D Object Detection *Sazan Ali Kamal Mohammed, Mohd Zulhakimi Ab Razak, Abdul Hadi Abd Rahman and Maria Abu Bakar*
212	Generating and Integrating Diffusion Model-Based Panoramic Views for Virtual Interview Platform *Jongwook Si, Seongeun Yang, Jeyong Song, Seungjae Son, Sangjin Lee, Daemin Kim and Sungyoung Kim*
272	Classification of Pathogenic Molds on Peanuts using Image Processing and CNN *Madelaine S. Indino, Adryll Dustin C. Rosario and Jocelyn F. Villaverde*
343	Machine Learning-Based Classification of Termite Genera *Sundresan Perumal, Homathevi Rahman, Valliappan Raman, R Subramanian, T Bala Saatvik, G S Deepakkumar and R Roghan*
180	ECG Cardiac Abnormality Signal Classification using HMLP Network *Shazreen Shaharuddin, Nur Izzani Mat Rozi, Maizatullifah Miskan, Fakroul Ridzuan Hashim, Mohd Salman Mohd Sabr and Siti Noormiza Makhtar*

A2: Data-Driven Anomaly Detection and Monitoring	
Session Chair: Dr. Yoong Hou Pin	
Paper ID	Paper Title
132	Real-time Acoustic Based Anomaly Detection of Composite Specimen using Convolutional Autoencoder *Iqraq Kamal, Veronica Lestari Jauw, Sivadas Chandra Sekaran, Kan Ern Liew, Jee Hou Ho and Chin Seong Lim*
125	A Combined Distance Metric Approach with Weight Adjustment for Improving Mixed Data Clustering Quality *Aung Pyae, Yeh-Ching Low and Hui Na Chua*
339	Non-Intrusive Biomass Estimation in Aquaculture using Structure from Motion within Decision Support Systems *Nyiak Tien Tang, Kit Guan Lim, Hou Pin Yoong, Fui Fui Ching, Tianlei Wang, Kenneth Tze Kin Teo*
340	AIoT-Driven Machine Learning for Anomaly Detection in Structural Health Monitoring *Lorita Angeline, Kit Guan Lim, Min Keng Tan, Muhd. Nur Afnan Uda, Joaquim Abel Jenarun and Kenneth Tze Kin Teo*
290	Integrating AI with Conventional X-ray Inspection for Improved Solder Void Detection in SSDC SiC Modules *Muhammad Haikal Mohd Sa'at, Muhammad Herman Jamaluddin, Muhammad Irshat Mohamed Ameerdin, Ahmad Zaki Shukor, Tarmizi Ahmad Izuddin, Masrullizam Mat Ibrahim, Muhamad Shafiq Sukiman*

Technical Program
Parallel Session B

B1:AI in Transportation and Navigation	
Session Chair: Dr. Lorita Angeline	
Paper ID	Paper Title
81	Vehicle Detection Based on Improved YOLOv8 *Chin Hong Lim, Connie Tee and Kah Ong Michael Goh*
252	Trajectory Planning of Stratosphere Airship in Wind-Cloud Environment Based on Soft Actor-Critic *Yanfeng Wang, Baojin Zheng, Wenjie Lou, Liran Sun and Chao Lv*
279	Adaptive Traffic Signal Control using Genetic Algorithm for a 2×2 Traffic Network *Min Keng Tan, Shun Quan Chai, Helen Sin Ee Chuo, Kit Guan Lim, Hui Hwang Goh and Kenneth Tze Kin Teo*
281	Utilisation of the Dijkstra Algorithm to Determine the Shortest Path on Universiti Malaysia Sabah's Main Campus in Kota Kinabalu *Masitha Raziah Binti Henri, Shaliza Hayati A. Wahab, Salmah Fattah, Nordin Saad, Nur Athirah Maisarah Binti Tambrin, Nur Farah Izzati Binti Jamaluddin, Sherlyn Ong Shu Shien and Zarra Soffea binti Ghazalie*

B2: Forecasting and Predictive Models	
Session Chair: Ir. Dr. Chua Bih Lii	
Paper ID	Paper Title
92	Long-Term Load Forecasting Based on Hybrid CEEMDAN-SSA-BiGRU-Attention Model *Jiajian Lin, Lit Yen Yeo, Yuting Sheng, Mehran Motamed Ektesabi, Jalal Tavalaei and Hadi Nabipour Afrouzi*
182	Transformer Health Index Monitoring using Supervised Prediction Model *Afzan Zamzamir, Nazrul Fariq Makmor, Ja'Afar Adnan, Azharudin Mukhtaruddin, Ardiata Septiana and Yulni Januar*
325	Ensemble Machine Learning Method for Health Insurance Premium Prediction *Lee Sijie, Florence Sia, Rayner Alfred and Ervin Gubin Moung*
341	CNN-LSTM Neural Network-based Short-term PV Power Generation Forecaster *Siti Nurfadilah Binti Jaini, Deugwoo Lee and Choong Wai Heng*

Technical Program
Parallel Session C

C1: Cryptography and Security	
Session Chair: Ts. Dr. Tan Soo Fun	
Paper ID	Paper Title
25	User Authentication with Keystroke Dynamics: Performance Evaluation in Neural Network *Xin-Jin Kek, Yu-Beng Leau and Soo Fun Tan*
166	Research Issues and Challenges in the Computational Development of Trustworthy AI *Shahina Begum, Mobyen Uddin Ahmed, Shaibal Barua, Md Alamgir Kabir and Abu Naser Masud*
311	Enhancing Electronic Document Security with Lightweight Digital Signature *Tan Soo Fun, Nur Sufia Binti Ahmad Zulkifli, Florence Sia and Lai Po Hung*
318	Enhanced Authentication Protocol for Securing Internet of Medical Things with Lightweight Post-Quantum Cryptography *Chris Ka Man Lo, Soo Fun Tan and Gwo Chin Chung*

C2: Optimisation Strategies	
Session Chair: Assoc. Prof. Dr. Renee Chin Ka Yin	
Paper ID	Paper Title
119	Optimizing Masked Face Recognition: A Tailored CNN Integrates with Different Classifiers *Yo Ming Chun, Chong Siew Chin and Chong Lee Ying*
215	Copy-Move Forgery Detection Optimization using Harmony Search with Clonal Selection Algorithm *Mohd Hanafi Ahmad Hijazi and Ezlyn Sherlyn Josmin*
327	Yield Optimization for Exothermic Batch Processes using Particle Swarm Optimization *Min Keng Tan, Matthew Laurentius Bansing, Huiyi Xu, Helen Sin Ee Chuo, Heng Jin Tham and Kenneth Tze Kin Teo*
283	Enhancing Face Detection Accuracy with VGG16 Neural Network and Data Augmentation *Min Keng Tan, Jun Shen Chin, Renee Ka Yin Chin, Lorita Angeline, Chung Fan Liau and Kenneth Tze Kin Teo*

Technical Program

Parallel Session D & E

Dr: AI in Medical and Healthcare	
Session Chair: Dr. Lai Po Hung	
Paper ID	Paper Title
113	Vision Transformer-Based Breast Mass Diagnosis in Mammography Using Bilateral Information *Tianyu Zeng, Zhang Zhang, Yuwen Zeng, Xiaoyong Zhang, Kei Ichiji and Noriyasu Homma*
191	Web-Based Medical Information System for Stroke Rehabilitation Internet-of-Things (RIOT) Patients: A Prototype *Nurul Hanis Mohd Dhuzuki, Ahmad Anwar Zainuddin, Saidatul Izyanie Kamarudin, Dini Handayani, Krishnan Subramaniam and Mohd. Izzuddin Mohd. Tamrin*
304	Superficial Wound Classification Using CNN Image Classifier for Initial Wound Care *Sitti Wan Fazirah Ambo'Miri, Lai Po Hung, Florence Sia Fui Sze and Tan Soo Fun*

Er: AI-Enhanced Control and Inspection	
Session Chair: Dr. Helen Chuo Sin Ee	
Paper ID	Paper Title
121	Force Control and Slip Detection for a Non-Backdrivable Robotic Gripper *Joseph Joshy, Bijo Sebastian and Asokan Thondiyath*
323	Structural Optimization Design of the Rotary Blowout Preventer Shell Based on an Adaptive Sand Cat and Whale Optimization Algorithm *Tian Haijiang, Hou Pin Yoong, Bih Lii Chua and Ismail Saad*
321	Distance Recognition Using QR Code Marker *Ian Jian Yi Lee, Hou Pin Yoong, Kenneth Tze Kin Teo and Chang Yii Chai*
331	Adaptive Exponential Feeding Control for a Fed-batch Yeast Fermentation Process Using Reinforcement Learning *Khairul Aznizam Sodiwal, Wan Ying Chai, Min Keng Tan, Kenneth Tze Kin Teo and Heng Jin Tham*

Technical Program
Parallel Session F & G

F1: AI in Network and Localization Systems	
Session Chair: Dr. Aroland M'Conie Jilui Kiring	
Paper ID	Paper Title
115	COLREGs Inspired Decentralised Path Planning for Multi-Agent System *Eshant Jha, Abhilash Somayajula, Don Gideon, Sayooj P Raveendran and Bijo Sebastian*
133	Improved FBVANET Based on Hierarchical Stability Rate *Ahmad Firdaus Muhammad Melvin, Ismail Ahmedy and Saaidal Razalli Azzuhri*
335	Ant Colony Optimization based Multi-Hop Wireless Transmission for Enhanced Network Reliability *Kit Guan Lim, Mohd Fikry Fazri bin Sakimin, Longxin Wei, Min Keng Tan, Soo Siang Yang and Kenneth Tze Kin Teo*
342	Evaluation of Theoretical and Empirical Log-Normal Models for WiFi Fingerprint Mapping in Indoor Positioning *Mohamed Aizad Bin Mohamed Ghazali, Aroland Kiring, Lyudmila Mihaylova, Hoe Tung Yew, Seng Kheau Chung and Yan Yan Farm*

G1: AI Innovations in Diverse Domains	
Session Chair: Dr. Florence Sia Fui Sze	
Paper ID	Paper Title
105	A Multilingual BERT Embeddings Approach in Identifying Factors Influencing Employability among Pre-University Students *Theng-Jia Law, Choo-Yee Ting, Hu Ng, Hui-Ngo Goh and Quek Albert*
128	Spam Review Detection in E-Commerce using Machine Learning *Muhammad Na'im Rizali, Marshima Mohd Rosli and Nur Atiqah Sia Abdullah*
245	Correlation Study of Ripe and Rotten Citrus Fruits Using Neuro-Fuzzy Algorithm *Erinn Chloe F. Sanchez and Jocelyn F. Villaverde*
296	Optimized Convolutional Neural Network Using Genetic Algorithm for Music Genre Classification *Hana Magdelina Yumil, Florence Sia, Tan Soo Fun and Lai Po Hung*
333	Predictive Maintenance using Deep Reinforcement Learning *Aravind Supramaniam and Sharifah Sakinah Syed Ahmad*

Technical Program
Parallel Session H

H1: Agricultural Disease Detection	
Session Chair: Assoc. Prof. Dr. Jamal Ahmad Dargham	
Paper ID	Paper Title
35	YOLOv5-Based Image Processing for Pineapple Rind Defect Detection *Joseph Kenneth G. Manzano, Joel Aldrin P. Ea and Meo Vincent C. Caya*
85	Defect Classification of Green Coffee Beans Using YOLOv8 *Giulliano I. Suarez, Nicolas Irvin A. Cubilla and Carlos C. Hortinela IV*
224	Plant Leaf Diseases Classification Using SVMs, XGBoost, and CNNs Based Texture Features *Abdullah Kamal Sami and Khamael Al-Dulaimi*
276	Unmanned Aerial Vehicle-enabled Deep-Learning Based Detection and Segmentation *Denmel Paul S. Saavedra and Alonica R. Villanueva*
278	Development of a Computer Vision Application for Mango (Mangifera indica L.) Fruit Defect Detection Using YOLOv8 Architecture *Kaycee Kaye Villanueva, Juvy Amor M. Galindo, Apple Joy R. Tamayo, Jamie Eduardo C. Rosal and Daryl Ivan E. Hisola*
305	Optimizing Citrus Leaf Disease Detection: An Efficient Custom CNN Leveraging Efficient Training Parameters *Mahir Faisal Chowdhury, Amit Nondi, Sium Ubn Akhter, Tanjina Bilma Pathan and Dewan Ziaul Karim*

H2: Human Motion Analysis	
Session Chair: Ts. Dr. Norfarariyanti Parimon	
Paper ID	Paper Title
145	A Motion Capture Quality Comparison Between Rokoko and Kinect *Monica M.Q. Li*
171	Position-Specific Batting Role Assignment and Player Ranking Using Ensemble Learning *R. A. R. S. Rajapaksha and B. M. T. Kumarika*
235	LLM based Enhanced Form Checker for Weight Training Exercises *Sudhir Manivannan, Yuvan Pradhan, Zain Muhammed, H. Pooja and R. Bharathi*
271	Enhancing Exercise Efficacy: A Predictive EMG Analysis for Dumbbell Press Workouts *Pranav T Pattanashetty, Shreya Chaurasia, Sujatha R Upadhyaya and Ramesh Debur Visweswara*
286	A Cancellable Semi-Supervised Gait Recognition in 5G: The Future of Biometric *Joyce Tlhoolebe, Neo Rafifing, Pulafela Akofhang Majoo, Oabile Lesley Boitshoko and Tlamelo Emmanuel*

H3: Disease Detection and Diagnosis Techniques	
Session Chair: Dr. Gohar Rahman	
Paper ID	Paper Title
27	A Neural Network Learning Approach Using ConvNet Models to Consolidate Corneal Ulcer Detection in Opthalmology *Md Kaviul Hossain*
149	Machine Learning Approach for Early Diagnosis of Alzheimer's Disease Using rs-fMRI and Metaheuristic Optimization with Functional Connectivity Matrices *Yusuf Bahri Özçelik, Aytaç Altan and Ceren Kaya*
248	Augmented Deep Learning for Enhanced Early Brain Tumor Detection *Abeer Elkhouly, Mahmoud Kakouri, Mohamed Safwan and Obada Al Khatib*
266	A Deep Learning Based Ensemble Approach for Gastrointestinal Disease Detection with XAI *Dewan Ziaul Karim, Tasfia Anika Bushra and Shoaib Ahmed Dipu*
303	Cervical Cancer Detection Using Deep Learning on Liquid-Based Cytology Pap Smear Images *Adya Bharadwaj and Atul Dubey*

H4: Agriculture and Plant Classification	
Session Chair: Ir. Dr. Mazlina Mamat	
Paper ID	Paper Title
34	Ornamental Plant Classification System Using Image Processing and Machine Learning *Miguel Q. Deveraturda, David Ronin D. Reyes, Meo Vincent C. Caya*
57	Smart Agriculture with Enhanced Accuracy for Fruit Detection Using Conv2D *Yashfa Kamran, Mahnur Tauqeer, Moiz Ahmad, Syed Muhammad Hamza Tauqeer*
83	A Neural Network Approach to Enhance Data Quality and Network Lifetime in IoT-based Smart Agriculture *Abhishek Bajpai, Shalinee Sahu, Naveen Tiwari, Anita Yadav*
140	Ripeness Classification of Lycopersicon Esculentum Employing Faster Region-based Convolutional Neural Network with Inception Version 2 *Shane Patrick A. Panilag, Jamie Eduardo C. Rosal, Apple Joy R. Tamayo, Juvy Amor M. Galindo, Cesar A. Tecson*
312	Image Recognition of Different Hamster Breeds Using Convolutional Neural Networks *Allen Paulo S. Estrella, Francis Miguel O. Lucban, Meo Vincent C. Caya*
317	Wood Type Classification Through Image Processing Using YOLOv8 *Lorenzo, Emmanuel D., Cruz, Sean Gabriel J., Manlises, Cyrel O.*

Technical Program
Parallel Session I

I1: Emotion and Mental Health Analysis	
Session Chair: Assoc. Prof. Ts. Dr. Chin Kim On	
Paper ID	Paper Title
300	A Multi-Modal Approach for Predicting Depression Risk using Social Media Data *Alexander, Mei Kuan Lim and Weng Kin Lai*
142	Revolutionary Depression Detection Methodology Employing BERT on Social Media Platforms *Anuraag Raj, Zain Ali, Shonal Chaudhary, Kavitesh Kumar Bali and Anuraganand Sharma*
150	Bengali Speech Sentiment Analysis using Machine Learning Models: A Comparative Study *Mohammad Tanveer Shams, Md. Akib Hasan, Animesh Das Chowdhury, Tabassum Jahan Lamia, Md. Reasad Zaman Chowdhury and Mohammad Marufur Rahman*
211	Stacked Bi-LSTM for Advanced Toxicity Detection in Comment Classification *Naveen Kumar, Prabhakaran Abraham, Syed Ibrahim Kaliba, V.C. Dinesh, R. Maruthamuthu, Balamurugan Murugan, P.Seshu Kumar and Naveen Vekkudu*
265	Speech Emotion Recognition in Filipino Spoken Language Using Deep Learning *Sally G. Corpus and Alonica R. Villanueva*
280	Optimizing Temporal Segmentation of Multi-Modal Non-EEG Signals for Human Stress Analysis *Gowtham G Iyer, Radhagayathri Udhayakumar, Shivapratap Gopakumar and Chandan Karmakar*

I2: Visual Recognition and Classification Systems	
Session Chair: Dr. Herwansyah Lago	
Paper ID	Paper Title
73	Bridging Visual Representation and Efficiency for Resource-Constrained Devices *Adityam Ghosh, Xinfeng Ye and Sathiamoorthy Manoharan*
147	Real-time Recognition of Malagasy Banknotes (Ariary) *Miandrisoa Hoby Randriatsarafara, Volatiana Marielle Ratianantitra and Thomas Mahatody*
256	Pants Style Classification Using YOLOv8: An Approach for Enhanced Detection of Pants *Ivan Matthew R. Chan, Marvin Druce T. Hao and Cyrel O. Manlises*
273	A Hybrid Model for Deciphering Doctors Handwriting Notes Recognition *Santosh Khanal and Rabindra Bista*
288	Transformer Tracking Using Spatiotemporal Features *J. Kugarajeevan, T. Kokul, A. Ramanan and S. Fernando*
306	A Machine Learning Framework for Change Detection with Remote Sensing Images *Josephina Paul*

I3: Predictive Analytics and Models	
Session Chair: Ts. Dr. Tan Min Keng	
Paper ID	Paper Title
56	Predicting Student's Success in Programming Courses: A Decision Support System for Admission in Computer Science and Information Technology Programs *Jaydee C. Ballaho*
64	Predictive Analysts and Time Series Forecasting Using Different Algorithm Machine and Deep Learning for Financial Market *Samah S Laftah and Sinan A Diwan*
159	Real-time Production Rescheduling with Machine Breakdown Using Genetic Algorithm-Adaptive Large Neighborhood Search Algorithm *Tran Ngoc Minh Tu, Chawalit Jeenanunta and Pisit Chanvarasuth*
165	Predicting Power Outages in Baghdad City Using Deep Learning Techniques *Saja Jafar Jawad and Shaymaa. W. Al-Shammari*
250	Electricity Load Forecasting Using Attention-based Hybrid Deep Learning Model *Adil Hussain, Vineet Dhanawat, Ayesha Aslam, Tariq and Faizan Zaman*
292	Courier System with Data Analyzer Using Time Series Forecasting and Recommender Model *Shawe G. Belano-Regla and Jheanel E. Estrada*

I4: Metaheuristics and Model Optimization	
Session Chair: Dr. Muhammad Nur Afnan bin Uda	
Paper ID	Paper Title
23	A Feature Importance Method Based on Cosine Similarity and Metaheuristic Algorithm *Edjola Naka*
76	DarkNet Traffic Recognition Using Meta-Learning *Sanaa Mohsin, Baraa Wasfi Salim and Awaz Naaman Saleem*
124	Exploring MCMC Guided GAN and Comparative Analysis for Uneven Class Distribution *Nandita Nishika and Anurag Sharma*
130	Comparative SHAP Analysis on SVM and K-NN: Impacts of Hyperparameter Tuning on Model Explainability *Ikhlass Boukrouh, Faouzi Tayalati and Abdellah Azmani*
138	Score Function Design for Decision Making Using Conditional Kullback-Leibler Divergence *Sanghyuk Lee and Eunmi Lee*
143	DeepExtract: Neural Networks Based Image Keypoints Extraction for Indirect SLAM Algorithms *Maurya Gurram, Prakash Kumar Uttam and Shantipal S. Ohol*

Technical Program
Parallel Session J

J1: Traffic and Communication Systems	
Session Chair: Ts. Dr. Lim Kit Guan	
Paper ID	Paper Title
30	Precoding-assisted FDMA Transmission Scheme: A CP-available FBMC Technique *Ying Wang, Jianhong Xiang and Linyu Wang*
153	Comparative Study of Region Based Approaches to Road Image Classification of National Highways of Bangladesh Using Deep Learning Models *Md. Akib Hasan, Animesh Das Chowdhury, Sakif Hussain Shachcha, Md. Tanjilur Rahman and Kazi A. Kalpoma*
164	Energy-Based Resource Allocation in UAV- Assisted Mobile Networks for Public Safety *Yasmina Alaa Mohamed, Angeles Vázquez-Castro, Mohamed Essam Khedr and Mohamed Salah Mahm*
237	Leveraging OBD II Time Series Data for Driver Drowsiness Detection: A Recurrent Neural Networks Approach *Khubab Ahmad, Em Poh Ping and Nor Azlina Ab Aziz*
313	Privacy-preserving Quantum Key Distribution Ensemble Paillier Cryptosystem for Securing IoT Based Smart Metering System *Md Mehedi Hasan, Mohammad Kamrul Hasan, Ravie Chandren Muniyandi, Shayla Islam and Say Leng Goh*

J2: Signal Processing and Recognition Applications	
Session Chair: Assoc. Prof. Ir. Dr. Yang Soo Siang	
Paper ID	Paper Title
58	MoodWave Music Matcher: An Exploration of AIDriven Music Curation Based on Facial Analysis *Upasana Tiwari, Abhishek Tiwari, Shwetanshu Sood and Omprakash Suthar*
107	Noise Detection and Removal for Underground Communication Systems Based on L2 Normal Inner Product *Bangwei Yu, Yong Wang, Liangang Qi and Yang Liu*
136	Identification of Urban Sounds with Haptic Feedback Using Raspberry Pi and LSTM-SVM *Kyle Kenshin T. Morales, Carlo Jose G. Castillo and Rosemarie V. Pellegrino*
162	Sign2Text: Deep Learning-based Sign Language Translation System Using Vision Transformers and PHI-1.5B *Gadha Lekshmi P and Rohith Francis*
154	Vehicle Class Detection and Counting on a Malaysian Road Using YOLOv8 and OpenCV *Mahbub Hassan, Hridoy Deb Mahin, Muzammil Jusoh, Abdullah Al Nafees, Arpita Paul and Md Ashequl Islam*

J3: System Control and Fault Detection	
Session Chair: Assoc. Prof. Ir. Ts. Dr. Melvin Gan Jet Hong	
Paper ID	Paper Title
15	Implementation of Support Vector Machine Algorithm in a Real-time BLDC Motor Bearing Fault Classification with Discrete Wavelet Transform as Feature Extractor *Shan Joshua Raym C. Masangkay, Lester Joseph B. Mendigoria, Ivan Ross M. Reyes and Conrado F. Ostia Jr.*
97	An Encoded Double Auxiliary Pilot Channel Estimation Method for Intrinsic Interference Cancellation in FBMC/OQAM Systems *Sixuan Xing, Jianhong Xiang, Ying Wang, Liangang Qi and Yu Zhong*
146	SPECTRUM: A Multi-Component Pipeline for High-Quality Image Synthesis *Vishal Kumar, Kavitha Nair R, Amelesh M, Deepak Choudhary and Sachin Shree*
274	Smart Industrial Machine Management and Control System Based on IoT *Pritom Sadhu, Arajit Saha, Md. Abdul Muttalib Moon, Md. Asaduzzaman Fahim, Sumayea Alam Sara, Sazib Hosen, Salman-E-Admia, Munmun Akond, Kh. Asekur Rahman and D.M. Idid Ibne Asad Enan*

J4: Food and Agricultural Product Assessment	
Session Chair: Dr. Chung Seng Kheau	
Paper ID	Paper Title
236	EfficientNet-Lite 4-Based Classification System for Grading Philippine Strawberries *Maria Annegela C. Dionisio, Isaac Joaquin D. Salazar and Carlos C. Hortinela IV*
241	Shrimp Freshness Quality Assessment Using YOLOv5 *Gwyneth Patricia D. Sigua, Cristelle S. Corpuz and Jocelyn F. Villaverde*
267	Development of a Computer Vision Application for Copra Meat Cooking Detection and Classification Using YOLOv8 Architecture *Crister A. Canitan, Jamie Eduardo C. Rosal and Daryl Ivan E. Hisola*
302	Classification of Razor Clams through Shape and Size via YOLOv8 *Aaron Jason B. De Dios, Arvin Ian Aronce and Cyrel O. Manlises*
315	Domoic Acid Detection of Razor Clams through Muscle Tissue via YOLOv8 *Arvin Ian. Aronce, Aaron Jason B. De Dios and Cyrel O. Manlises*

Technical Program
Parallel Session K

K1: Environmental and Ecological Monitoring	
Session Chair: Dr. Chai Chang Yii	
Paper ID	Paper Title
108	Tackling Marine Pollution with IoT and Conditioned Diffusion *Aditya Shivakumar*
210	Pollen Prediction Using ANN and DNN *Veer Garg, Vivek Kumar and Hitesh Singh*
258	Development of a Database for the Classification of the Severity of Algal Bloom with the Implementation of Support Vector Machine *Rodmar V. Lanuza, Russell Dwayne F. Magday and Analyn N. Yumang*
316	Classification of Green Series Fischer's Lovebirds Using Fuzzy Logic Algorithm *Jobert D. Apilado, Aron Miguel R. Jintalan and Cyrel O. Manlises*
238	Recycle Waste Detection and Classification Model Using YOLO-V8 for Real-time Waste Management *Mohamad Azfar Mohamad Rastari, Rosniza Roslan, Raseeda Hamzah, Noor Hasimah Ibrahim Teo, Fadilah Ezlina Shahbudin and Khyrina Airin Fariza Abu Samah*

K2: Healthcare Applications and Technologies	
Session Chair: Dr. Nooralisa Binti Mohd Tuah	
Paper ID	Paper Title
20	Self-Applicable Eye Strain Detection through the Measurement of Blink Rate Using Raspberry Pi *Mon Timothy Isaac M. Carcellar, Carl Justin S. Tychuaco, Analyn N. Yumang*
254	A Comprehensive Survey on Federated Learning and Its Applications in Health Care *Sheilla Ann B. Pacheco*
269	SCAAV: Sensored Cane as an Alternative Aid for Visionless *Jannah Vea A. Junsay, Kurt Gabriel I. Royales, Joseph Bryan G. Ibarra*
298	Feature Engineering for Optimizing AI-Driven Classification Models in Non-Proliferative Diabetic Retinopathy Stage Detection *Induwara M.S., Fernando I.A.S.I., Isuranga T.H.N., Wijewardhana U.L., Dissanayaka M.M., Balagalla U.B.*

K3: Industrial and Mechanical Systems	
Session Chair: Dr. Mohd. Suffian bin Misaran @ Misran	
Paper ID	Paper Title
151	Deep Learning-Based Inteligent X-bar Control Chart for Manufacturing Process Monitoring *Faouzi Tayalati, Ikhlass Boukrouh, Abdellah Azmani and Monir Azmani*
294	Unsupervised Human Action Recognition for Quality Control in Industrial Environments *Wetu Vexo, Chawalit Jeenanunta, Sapa Chanyachatchawan, Apinun Tunpan and Nisit Sirimarnkit*
329	Effect of Cooling Channel Structure on Permanent Magnet Synchronous Motor *Zhencai Huang, Hui Chen, Kit Guan Lim, Min Keng Tan, Bih Lii Chua and Kenneth Tze Kin Teo*
330	Impact of Helical Channel Number on Synchronous Motor Cooling Performance *Xiang Lei Meng, Hui Chen, Min Keng Tan, Kit Guan Lim, Bih Lii Chua and Kenneth Tze Kin Teo*

K4: Security and Surveillance	
Session Chair: Assoc. Prof. Ts. Dr. Leau Yu Beng	
Paper ID	Paper Title
17	Implementation of Dynamic Image for Facial Expression Recognition on Indonesian Facial Expression Dataset *Irene Anindaputri Iswanto, Andry Chowanda, Haryono Soeparno and Widodo Budiharto*
24	Application of Pose Recognition for Suspicious-Activity Detection Alarm System *Abejun Ranz A. Manuel, Riley Sebastianne D. Bughaw, Charmaine C. Paglinawan and Leonardo D. Valiente*
118	Development of a Drone with Human Detecting Capabilities Using Thermal Camera for Landslide Search Operations *Sammuel Jann L. Vasquez, Kyla Fate J. Yumang and Charmaine C. Paglinawan*
260	Facial Recognition with Deblurring Component (RL Deconvolution) Utilizing MATLAB and OpenCV for Household Surveillance *Kyle Mikael Pacudan and Charmaine C. Paglinawan*

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