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## Foreword

### **Special Issue on Computer and Drone Applications: Digital Innovation for Sustainable Development**

We are pleased to introduce the Journal of Information Science and Engineering Special Issue on Computer and Drone Applications, which stems from the success of the third International Conference on Computer and Drone Applications (IConDA) 2022. The conference, themed "Digital Innovation for Sustainable Development," brought together experts from academia and industry to share knowledge and explore innovative solutions to achieve the United Nations' Sustainable Development Goals (SDGs). The conference highlighted the crucial role of digital innovation in addressing current challenges such as climate change, biodiversity loss, and social inequality. Keynote speakers and presenters showcased cutting-edge research and projects that leveraged drone technology, artificial intelligence, and data-driven intelligence to combat these challenges. The conference also emphasized the importance of collaboration between academia and industry in developing practical solutions that can be immediately applied to achieve the SDGs. This special issue of the Journal of Information Science and Engineering features selected papers from IConDA 2022. A brief synopsis of each article is provided below.

The paper entitled "Comparing Model Building Performance of ARIMA Model and Logarithmic Return Model" presents the Logarithmic Return (LR) model as an alternative approach for modeling autocorrelated data. The proposed model aims to address the issues of laborious, time-consuming, and cumbersome iterative modeling procedures with using the autoregressive integrated moving average (ARIMA) model in the process control environments. In addition to offering simplicity and ease of computation, the LR model demonstrates shorter running times compared to ARIMA counterpart. Impressively, the LR model achieves comparable accuracy, as evidenced by mean average percentage error (MAPE).

The paper entitled "Multivariate Machine Learning Models for Accurate and Robust Multi-UAV Throughput Prediction" investigates the three distinct Machine Learning (ML) models within the realm of Channel Quality Prediction (CQP) models for multi-UAV networks. The authors addressed the gaps on the models that are proposed in the literature are typically designed for static cellular networks and overlooking the pivotal aspects of robustness and cross-

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domain accuracy crucial for anticipatory UAV networks. By leveraging univariate and multivariate network metrics data obtained through OMNeT++ simulations, the authors scrutinize the efficacy of these models in both in-domain and cross-domain evaluations, assessing their accuracies and robustness. Their findings underscore the indispensable role of multivariate data in enhancing in-domain performance, while also advocating for the adoption of more sophisticated models like Seq2seq to ensure robustness across diverse operating conditions, showcasing a remarkable improvement in cross-domain CQP performance over alternative ML models.

In the rapidly evolving field of medical image analysis, the challenge of acquiring extensive, high-quality labeled data for deep learning models remains significant. The paper entitled "Semi-Supervised Learning Using Co-Generative Adversarial Network (Co-Gan) for Medical Image Segmentation" introduces an innovative approach that leverages both limited labeled data and abundant unlabeled data. The authors present a new Co-GAN framework that is based on Generative Adversarial Networks (GANs) and co-training strategies. The purpose of the research is to improve the accuracy of medical image segmentation. This framework features a dual-generator and single-discriminator architecture, facilitating mutual information exchange between generators through adversarial training. The authors compare fully supervised learning, semi-supervised GAN, and the proposed Co-GAN across different proportions of labeled and unlabeled data using the Medical Segmentation Decathlon (MSD) hippocampus dataset.

In the context of growing trend of utilizing virtual private networks (VPNs) for secure remote access, many universities persist in using outdated protocols, which expose them to significant security risks. The paper entitled "An IKEv2-based Approach for Remote Access VPN on MikroTik Router" proposes a robust solution using IKEv2 VPN on MikroTik routers. This study aims to provide an in-depth configuration guide for setting up a secure, reliable, and high-performing VPN. Through a step-by-step setup process and detailed performance analysis, the paper demonstrates how universities can enhance their network security and efficiency.

We hope that this special issue will serve as a valuable resource for researchers, practitioners, and policymakers who are working to achieve the SDGs. We believe that the articles in this issue will inspire new ideas and collaborations that will help us build a more sustainable future for all.

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## • Introduction to Guest Editors •



**Beng Yong Lee (李民嶸)** received his Ph.D. degree in Computer Science from Universiti Malaysia Sarawak, Malaysia, in 2018. In 2003, Dr Lee joined the College of Computing, Informatics and Mathematics, Universiti Teknologi MARA, as a faculty member. Dr Lee's research interests include computer vision, extended reality, and human-computer interaction. He has co-authored many technical international conferences and journal papers. Dr Lee is a certified professional technologist in information technology by the Malaysia Board of Technologists. He has been actively involved in various academic and professional activities, including serving as a guest editor for the Journal of Smart Science and Technology and Journal of Information Science and Engineering. He served as the Conference Chair for the International Conference on Computer and Drone Applications (IConDA) in 2017, 2019, and 2022. Dr Lee's notable achievements include winning the grand prize at the 2021 Sarawak Multimedia Authority (SMA)-AI Intelligent Virtual Assistant (IVA) Competition and receiving the best presenter award at the 6th International Conference on E-Business and Applications, 2020 held in Kuala Lumpur. He won the Malaysia Technology Expo gold medal award in 2011 and the International Invention, Innovation & Technology Exhibition bronze medal award in 2008. Dr. Lee's multifaceted contributions reflect his commitment to advancing education, research, and industry collaboration in the domain of computer science and information technology.

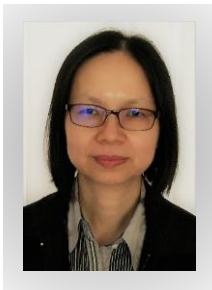


**Lee Hung Liew (劉麗宏)** received her Ph.D. in Computer Science from Universiti Malaysia Sarawak in 2019. Since 2006, she has been a committed academic staff member at the College of Computing, Informatics and Mathematics, Universiti Teknologi MARA, Sarawak Branch, where she currently holds the position of senior lecturer. Dr Liew is actively engaged in the professional and scholarly community. She contributes to numerous international and local conferences as an organizing committee member, technical program committee member, and reviewer. She notably served as the secretary for the Interna-

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tional Conference on Computer and Drone Applications (IConDA) in 2017 and 2019, and as the publication chair in 2022. Her editorial contributions include serving as a guest editor for the Journal of Information Science and Engineering. Dr Liew's research interests include pattern recognition, computer vision, image processing, agent-based modeling, mixed reality, machine learning, computational modeling, and computing education. She has been involved in various research projects funded by multiple grants and is a member of the Institute of Electrical and Electronics Engineers (IEEE).



**Chin Ying Liew (劉靜盈)** obtained her Ph.D degree in Computational Science from Universiti Malaysia Sarawak, Malaysia, in 2016. She has been with the Department of Mathematical Sciences under the College of Computing, Informatics and Mathematics, Universiti Teknologi MARA since 2003. Her research interests include computational science modelling, applied mathematics, machine learning, and education. Dr Liew has authored or co-authored a number of research journal articles and conference proceedings, focusing particularly on computational modelling through the bipartite-network-based modelling approach and various issues related to mathematics instructions. She actively participates in research and consultation projects as principal investigator or co-researcher under various research grants. Additionally, Dr Liew has served as a guest editor for the Journal of Smart Science and Technology and Journal of Information Science and Engineering. Over the years, Dr Liew has been involved in community service activities and has assisted in organizing various international conferences. She has held roles such as the vice-chair, head of the technical committees, and head of the publication committees of the organizing committees, including the International Conference on Computer and Drone Applications (IConDA) in 2017, 2019, and 2022. She has received several awards, including best paper awards, and has won multiple innovation awards, including gold and silver awards. Dr Liew is passionate about contributing to the advancement of research and education, particularly in the fields related to her expertise.

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**Raylin Tso (左瑞麟)** is currently the Distinguished Professor in the Department of Computer Science, National Cheng-chi University, Taiwan. He obtained his B.Eng. degree from National Tsing Hua University, Taiwan, in 1995. He received his M.Eng. and PhD degrees in Systems and Information Engineering from Tsukuba University, Japan, in 2004 and 2006, respectively. He has authored or co-authored over 200 papers in referred journals and conferences in the area of information security. His research interests are mainly in the areas of applied cryptography, PQC, FinTech security, privacy preserving data analysis, and blockchain technology. Raylin Tso has received many academic awards including, IPSJ Digital Courier Award for Young Researcher (2006), Dean's Award of the Graduate School of Systems and Information Engineering, University of Tsukuba, Japan (2006), Research Award of College of Science (NCCU) for Early Career Researchers (2015) and Award of WITC 2015 Outstanding Researcher (2015). He has served as the Executive Editor of Internal Journal of Information and Computer Security until 2020 and currently served as the Associate Editor of the Journal of Information Science and Engineering.

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