

CONFERENCE PROGRAM

5th CCCIS 2025

2025 5th International Conference on **COMPUTER COMMUNICATION AND INFORMATION SYSTEMS**

// Hong Kong, China //
February 28-March 2, 2025



Conference Abstract

2025 5th International Conference on Computer Communication and Information Systems (CCCIS 2025)

February 28-March 2, 2025

Hong Kong, China

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Welcome Message

On behalf of the Conference Committee, we are delighted to welcome you to the 2025 5th International Conference on Computer Communication and Information Systems (CCCIS 2025) taking place from February 28-March 2, 2025, in the vibrant city of Hong Kong, China.

CCCIS 2025 invites contributions from all branches of International Conference on Computer Communication and Information Systems. Topics of interest include, but are not limited to: Algorithms, Autonomic and Trusted Computing, Big data and machine learning for networks, Biomedical Informatics and Computation, Business Analytics and Big Data, Cloud computing/mobile cloud computing, Computer Architecture, 5G and beyond networks, Cyber-security, Privacy and Ethics of IS, Datacenter networking, Age of Information, Cellular networks and CubeSats, etc.

This year, CCCIS received an impressive number of submissions from researchers, practitioners, and professionals from industry, academia, and government. All papers underwent a rigorous peer-review process by our conference committee members and international experts, with acceptance based on the quality and relevance of the submissions, ensuring a program of the highest caliber.

The CCCIS 2025 conference is designed to promote the exchange of knowledge and experiences among experts from industry and academia, as well as university students. This will be achieved through keynote speeches, technical sessions, and informal conversations among colleagues from around the world. We hope this conference will provide a memorable and valuable experience for all participants, fostering the discovery of new research domains, the dissemination of practical knowledge, and the cultivation of personal connections.

We are honored to have four distinguished keynote speakers this year:

- Prof. Sam KWONG Tak Wu, Lingnan University, Hong Kong, China, IEEE Fellow, Fellow of the US National Academy of Innovators, Fellow of the Hong Kong Academy of Engineering and Sciences, Chair Professor of Computational Intelligence, Associate Vice-President (Strategic Research) of Lingnan University.

- Prof. Qingfu Zhang, City University of Hong Kong, Hong Kong, China, IEEE Fellow, Chair Professor of Department of Computer Science, City University of Hong Kong, Hong Kong, China.
- Prof. Francis Chin, University of Hong Kong, China, IEEE Fellow, HKIE and HKACE, Emeritus Professor of University of Hong Kong, China.
- Prof. Wai Lun LO, Hong Kong Chu Hai College, China, Head of Department of Computer Science, Director of Research and Curriculum Innovation.

We would like to extend our heartfelt thanks to the committee members and staff, who have worked tirelessly to bring the initial vision for this conference to life. Their expertise, enthusiasm, and dedication have been instrumental in preparing the final program. We are also profoundly grateful to all authors, reviewers, and attendees for their contributions and participation in CCCIS 2025. Their commitment and expertise have been crucial in creating this high-quality program and ensuring the success of the conference. Finally, we wish all presenters and participants a productive and enjoyable conference experience.

Warmest regards,

CCCIS 2025

Conference chair

Yew Kee WONG Eric, Hong Kong Chu Hai College, China

Useful Information



ZOOM Download Link: <https://zoom.us/download>

Virtual Background & Slide Template: www.cccis.org/kits.rar

Please rename your screen name before entering the room.

Rename Screen Name Before Entering the Room	Examples
Authors: Paper ID-Name	CS1001-San Zhang
Delegate: Delegate-Name	Delegate-San Zhang
Keynote Speaker: Keynote-Name	Keynote-San Zhang
Invited Speaker: IS-Name	IS-San Zhang
Committee Member: Committee-Name	Committee-San Zhang

Materials Prepared by the Presenters

✧ **Oral Presentation:**

PowerPoint or PDF files

PowerPoint Background Template: www.cccis.org/kits.rar

Duration of Each Presentation

- ✧ Keynote Speech: 40 Minutes of Presentation including Q&A.
- ✧ Invited Speech: 25 Minutes of Presentation including Q&A.
- ✧ Regular Oral Presentation: 15 Minutes of Presentation including Q&A.

Tips

- ✧ The regular oral presentation time arrangement is for reference only. In case any absence or some presentations are less than 15 minutes, please join your session before it starts.
- ✧ An excellent presentation will be selected from each session which will be announced and awarded an excellent presentation certificate.

Venue

Hong Kong Chu Hai College

Address: 80 Castle Peak Road, Castle Peak Bay, Tuen Mun, N.T. Hong Kong.

香港新界屯門青山公路青山灣段 80 號



Google Map

Link: <https://maps.app.goo.gl/nQeKAJVG09fF6uWN9>



Related Information

Important Phone Numbers (available for Fixed line, public phone, mobile phone, and PHS):

Alarm Call: 999

Emergency Call: 120

Average Temperature in Feb Hongkong:

High Temp: 20 °C Low Temp: 15 °C Mean Temp: 18 °C

Please keep your properties/belongings carefully. It is advisable not to stay outside alone in the evening.

Keynote Speaker

Mar. 1, Saturday, 9:10-9:50, GMT+8, Beijing Time

Meeting Room: 6F-Room W612

ZOOM Link: <https://us02web.zoom.us/j/81279365872>

Zoom ID: 812 7936 5872

Password: 202502

Prof. Sam KWONG Tak Wu

Lingnan University, Hong Kong, China



Fellow of IEEE, Fellow of the US National Academy of Innovators

Fellow of the Hong Kong Academy of Engineering and Sciences

Chair Professor of Computational Intelligence, Associate Vice-President (Strategic Research) of Lingnan University

Speech Title: Creating a Better Future: Harnessing AI for Social and Environmental Responsibility

Abstract: In this talk, I will explore the potential of artificial intelligence (AI) to address some of the most pressing social and environmental challenges facing our world today. With its ability to analyze vast amounts of data, identify patterns, and make predictions, AI has the potential to revolutionize fields such as healthcare, education, and climate science.

However, as AI becomes more powerful and ubiquitous, it is also raising important ethical and social questions. How can we ensure that AI is used for the greater good, rather than contributing to inequality and injustice? How can we ensure that the benefits of AI are shared fairly across society, rather than concentrated among a small group of wealthy individuals and corporations?

In this talk, the speaker will delve into various questions related to AI applications and their positive impact on society and the environment. The talk will draw on examples of specific AI applications that are already making a difference. For instance, the underwater instance segmentation, which is the process of detecting and segmenting objects in underwater images. This technology has the potential to improve underwater exploration, marine conservation, and disaster response efforts.

Another example is image reconstruction based on compressive sensing. This technique allows for the reconstruction of high-quality images from a limited amount of data, which can be particularly useful in applications such as medical imaging or remote sensing. The third topic is the low night image enhancement, which is a technology that enhances images taken in low-light conditions. This can improve the accuracy and effectiveness of applications such as surveillance, transportation safety, and security.

By exploring these and other examples of AI applications, the talk aims to demonstrate the potential of AI to make a positive impact on society and the environment, and to inspire further innovation in.

Ultimately, this talk will aim to inspire and empower attendees to think critically about the role of AI in shaping our future, and to explore ways in which they can harness this powerful technology to create a more just, equitable, and sustainable world.

Bio: Professor KWONG Sam Tak Wu is the Chair Professor of Computational Intelligence, and concurrently as Associate Vice-President (Strategic Research) of Lingnan University. Professor Kwong is a distinguished scholar in evolutionary computation, artificial intelligence (AI) solutions, and image/video processing, with a strong record of scientific innovations and real-world impacts. Professor Kwong was listed as one of the top 2% of the world's most cited scientists, according to the Stanford University report. He was listed as one of the most highly cited scientists by Clarivate in 2022 and 2023. He has also been actively engaged in knowledge transfer between academia and industry. He was elevated to IEEE Fellow in 2014 for his contributions to optimization techniques in cybernetics and video coding. He was the President of the IEEE Systems, Man, and Cybernetics Society (SMCS) in 2021-23. Professor Kwong has a prolific publication record with over 350 journal articles, and 160 conference papers with an h-index of 83 based on Google Scholar. He is currently the associate editor of many leading IEEE transaction journals. He is a fellow of the US National Academy of Innovators. and the Hong Kong Academy of Engineering and Sciences.

Keynote Speaker

Mar. 1, Saturday, 9:50-10:30, GMT+8, Beijing Time

Meeting Room: 6F-Room W612

ZOOM Link: <https://us02web.zoom.us/j/81279365872>

Zoom ID: 812 7936 5872

Password: 202502



Prof. Qingfu Zhang

City University of Hong Kong, Hong Kong, China

Fellow of IEEE

**Chair Professor of Department of Computer Science,
City University of Hong Kong, Hong Kong, China**

Speech Title: Evolution of Heuristics: Towards Efficient Automated Algorithm Design Using Large Language Models

Abstract: Heuristics are widely used for dealing with complex search and optimization problems. However, manual design of heuristics can be often very labour extensive and requires rich working experience and knowledge. In this talk, I will introduce Evolution of Heuristic (EoH), an evolutionary paradigm that leverages both Large Language Models (LLMs) and evolutionary search for Automatic Heuristic Design (AHD). EoH represents the ideas of heuristics in natural language, termed thoughts. They are then translated into executable codes by LLMs. The evolution of both thoughts and codes in an evolutionary search framework makes it very effective and efficient for generating high-performance heuristics. Experiments on three widely studied combinatorial optimization benchmark problems demonstrate that EoH outperforms commonly used handcrafted heuristics and other recent AHD methods including FunSearch proposed by google deepmind.

Bio: Qingfu Zhang is Chair Professor of Computational Intelligence at the Department of Computer Science, City University of Hong Kong. His main research interests include evolutionary computation, optimization, neural networks, data analysis, and their applications. Professor Zhang is an Associate Editor of the IEEE Transactions on Evolutionary Computation and the IEEE Transactions Cybernetics. MOEA/D, a multiobjective optimization algorithm developed by him and his students, is one of the two most used multiobjective optimization framework. He was awarded the 2010 IEEE Transactions on Evolutionary Computation Outstanding Paper Award. He has been in the list of SCI highly cited researchers for five consecutive years, from 2016 to 2020. He is an IEEE fellow.

Keynote Speaker

Mar. 1, Saturday, 11:00-11:40, GMT+8, Beijing Time

Meeting Room: 6F- **Room W612**

ZOOM Link: <https://us02web.zoom.us/j/81279365872>

Zoom ID: 812 7936 5872

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Prof. Francis Chin

University of Hong Kong, China

Fellow of IEEE, HKIE and HKACE

Emeritus Professor of University of Hong Kong, China

Speech Title: Development and Future of Deep Learning

Abstract: Over the past decade, Deep Learning has already demonstrated great success across many applications such as object detection, image classification, speech recognition, translation, summarization, and chatbots (LLMs and ChatGPT), text to image and text to video. We envision that Deep Learning will have great potential in many other areas of research and applications.

In this talk, we shall revisit the development of Deep Learning, explain the key technologies for its success and how Deep Learning works. Finally, we shall give insights on the future development of Artificial General Intelligence.

Bio: Professor Francis Chin has taught at University of Maryland Baltimore County, University of Alberta, University of California San Diego, Chinese University of Hong Kong, University of Texas at Dallas. Professor Chin joined HKU in 1985, was founding Head and Chair of the Department of Computer Science and Taikoo Professor of Engineering at HKU. He had served as an Associate Dean of the Graduate School from 2002 to 2006 and the Faculty of Engineering from 2007 to 2014.

Professor Chin has served as conference chairman and a member of the program committee of numerous international workshops and conferences. He was the Managing Editor of the International Journal of Foundations of Computer Science and on the editorial boards of journals. Professor Chin received the HKU Teaching Best Teaching, Teaching Excellence Award and Outstanding Research Award in 1991, 2000 and 2010 respectively. Professor Chin with his bioinformatics team has won the RECOMB 2022 Test-of-Time Award based on the impact of their RECOMB2010 IDBA paper. He is also listed within the World's Top 2% Scientists published by Stanford University in October 2022.

Keynote Speaker

Mar. 1, Saturday, 11:40-12:20, GMT+8, Beijing Time

Meeting Room: 6F- **Room W612**

ZOOM Link: <https://us02web.zoom.us/j/81279365872>

Zoom ID: 812 7936 5872

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Prof. Wai Lun LO

Hong Kong Chu Hai College, China

Head of Department of Computer Science

Director of Research and Curriculum Innovation

Speech Title: Image based meteorological visibility estimation by using ANN

Abstract: Visibility can be interpreted as the largest distance of an object that can be recognized or detected under a bright environment which can be used as an environmental indicator for weather conditions and air-pollution. The accuracy of classical approach of visibility calculation, in which meteorological laws and image features extraction from digital images are used depends on quality and noise disturbances of the image. Therefore, artificial intelligence and digital image approaches have been proposed for visibility estimation in the past. Image features for the whole digital image are generated by pre-trained convolutional neural networks and Artificial Neural Network (ANN) was designed for correlation between image features and visibilities. Instead of using the information of the whole digital images, past research has been proposed to identify effective sub-regions from which image features are generated and ANN was designed to approximate the mapping between the feature values of the effective sub-regions and the visibility values. Past research results showed that this method is more accurate than the classical approach of using handcrafted features. However, the selection of effective sub-regions of digital image is not fully automated and based on manual selection by expert judgement. We will review the applications of ANN and automatic landmark object extraction techniques in estimation of meteorological visibility.

Bio: Professor Wai Lun LO has taught at Hong Kong Polytechnic University and joined the Hong Kong Chu Hai College (HKCHC) in 1999, he has been the Head of department of Computer Science since 2001, Associate Dean of Faculty of Science and Engineering from 2018 to 2024 and he is currently a Professor and Director of Research and Curriculum Innovation of the HKCHC. His research interests are applications of Artificial Intelligence and Machine Learning, intelligent control, computer vision, applications of machine learning and

computation algorithms in design of power electronic systems. Professor LO has served as Program chairman of the 2024 6th International Conference on Software Engineering & Development 2024 and the 2025 5th International Conference on Computer Communication and Information Systems. He was the Guest Editors of the special issues of the SENSORS Journals. Professor LO received the HKCHC outstanding research award in 2018. Professor LO is an Honorary Professor in Dental Science in Faculty of Dentistry of the University of Hong Kong. He is a Senior Member of IEEE.

Invited Speaker

Mar. 2, Sunday, 9:30-9:55, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

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Prof. Hong Lin

University of Houston-Downtown, USA

Speech Title: Sleep stage analysis by Bayesian Network

Abstract: Our research team built a self-learning Bayesian network adept at elucidating intricate relationship mappings within raw single-channel electroencephalography (EEG) data. The algorithm employed probabilistic graphical models to decode both the dynamic and static interdependencies inherent in EEG signals, providing an unprecedented framework for an in-depth understanding of sleep dynamics.

By proper signal discretization and construction of a Bayesian network, the system can autonomously identify and intricately model both time-invariant features and their dynamic relationships across various sleep stages. The innovative methodology we employed focused upon uncovering relationships present in the data by pivoting around the construction of a Bayesian network which autonomously learns probabilistic relationships from EEG data. Our approach diverges radically from traditional methods by seamlessly integrating automated feature extraction and intricate temporal sequence analysis within a single, unified modeling framework.

Bio: Hong Lin received his PhD in Computer Science from the University of Science and Technology of China. Before he joined the University of Houston-Downtown (UHD), he was a postdoctoral research associate at Purdue University, and an assistant research officer at the National Research Council, Canada. Dr. Lin is currently a Professor in Computer Science with UHD. His research interests include cognitive intelligence, human-centered computing, parallel/distributed computing, and big data analytics. He is the supervisor of the Grid Computing Lab and a co-founder of the Data Center at UHD. Dr. Lin currently serves as the program director for the Master of Science in Artificial Intelligence program at UHD. Dr. Lin is a senior member of the Association for Computing Machinery (ACM).

Invited Speaker

Mar. 1, Saturday, 14:00-14:25, GMT+8, Beijing Time

Meeting Room: 6F-Room W612



Prof. Koen Smit

**HU University of Applied Sciences Utrecht,
Netherlands**

Speech Title: Applied Research into Digital Twinning to Support the Policy Lifecycle and Spatial Planning by Regional and Local Governments in the Netherlands

Abstract: An increasing number of Dutch provinces and municipalities are engaged in the experimentation of Digital Twin technology, which involves the creation of digital replicas of regions, areas, cities, and neighborhoods. The ultimate objective is to support policy development and spatial planning practices. Digital Twins hold significant promise due to their capacity to incorporate and combine various areas of interest, such as biodiversity, mobility, heat stress, flood risk, sound levels, and more, within a dynamic digital (3D) environment. Digital Twins also enable real-time manipulation of variables pertaining to these areas of interest. At present, numerous independent initiatives involving Digital Twin technology are being pursued by Dutch provinces and municipalities; however, a lack of adequate collaboration exists among them. The Digital Twins lab at HU University of Applied Sciences Utrecht aims to build and facilitate extensive cooperation among these Dutch provinces and municipalities. To achieve this, the lab conducts research on various aspects, including legal, technical, governance, and ethical considerations.

This presentation will primarily focus on the structure and functioning of the Digital Twins lab, the outcomes attained through our studies, and the valuable insights gained from multiple (applied) research studies.

Bio: Koen Smit is a professor focusing on Digital Ethics at the HU University of Applied Sciences Utrecht, in the Netherlands. He obtained his PhD in Computer Science in 2018 at the Open Universiteit. His research primarily focuses on the combination of Business Process Management, Business Rules Management, Decision Management, Decision Mining, Digital Twin technology, and Social Robotics and Value Sensitive Design. His interest also leans towards how said technological innovations can be designed and implemented in such a way that human and public values are explicitly and adequately considered. He regularly reviews and/or publishes and presents his research contributions at conferences and journals (e.g., HICSS, ICIS, PACIS, AMCIS, PJAIS, JITTA, and BPM). Furthermore, he is part of the management team of the Institute for ICT of the same university. He supervises several PhD and Professional Doctorate students on his focus areas.

Invited Speaker

Mar. 2, Sunday, 13:00-13:25, GMT+8, Beijing Time

Zoom Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

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Prof. Ghulam Abbas

**GIK Institute of Engineering Sciences and Technology,
Pakistan**

Speech Title: Instruction-Level Parallelism in High-Performance and Networked Systems

Abstract: As computational demands grow, optimizing processor efficiency is essential for high-performance and networked computing environments. Instruction-Level Parallelism (ILP) plays a key role in improving execution speed by enabling multiple instructions to be processed concurrently. This talk explores ILP fundamentals, covering pipelining, multiple issue, and out-of-order execution techniques to enhance processor throughput.

We will discuss the impact of ILP on modern computing, particularly in data centres, HPC clusters, and AI-driven systems, where efficient instruction processing is critical. Additionally, we will examine pipeline hazards and strategies to mitigate them. The session will also highlight advanced ILP techniques and recent trends, which power modern high-speed processors.

By the end of this talk, attendees will gain a deeper understanding of how ILP optimizations contribute to computational efficiency in networked and high-performance systems, making it a crucial concept for both academia and industry.

Bio: GHULAM ABBAS received the B.S. degree in computer science from University of Peshawar, Pakistan, in 2003, and the M.S. degree in distributed systems and the Ph.D. degree in computer networks from University of Liverpool, U.K., in 2005 and 2010, respectively. From 2006 to 2010, he was Research Associate with Liverpool Hope University, U.K., where he was associated with the Intelligent & Distributed Systems Laboratory. Since 2011, he has been with the Faculty of Computer Science & Engineering, GIK Institute of Engineering Sciences and Technology, Pakistan. He is currently working as a full Professor, Head of Cybersecurity and Software Engineering Departments, and Director ICT Academy. Dr. Abbas is a co-founding member of the Telecommunications and Networking (TeleCoN) Research Center at GIK Institute. He is a Fellow of the Institute of Science & Technology, U.K., a Fellow of the British Computer Society, and a Senior Member of the IEEE. His research interests include computer networks and wireless and mobile communications.

Invited Speaker

Mar. 2, Sunday, 9:55-10:20, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Prof. Paulo Batista
University of Évora, Portugal

Speech Title: Theoretical Information Science

Abstract: Following the Second World War an explosion in the quantity of documentation led to a dramatic change in Archiving, or the profession referred to as records managers/records management and archivists/archives. Starting in the 1980s, however, archivists in Quebec began to make great progress by changing their approach and looking at the entire documentary cycle from current to definitive information. Carol Couture and Jean- Yves Rousseau made a crucial contribution towards the understanding of the Three Age Theory that viewed Archiving as an integrated discipline centered on a structural understanding of archives. In 1994, their work *Les Fondements de la Discipline Archivistique*, presented a new interpretation of Theodore Schellenberg's Three Age Theory. They called attention to the fact that the three phases of archival documents are not separate but, on the contrary, integrated. They argued that these three stages can even be looked at in a segmented way, provided the union between them is ensured. Their great innovation relative to Schellenberg's work lay, precisely, in critiquing the division and separation between the three ages of archival documents. Couture and Rousseau thereby brought together all the phases of the lifecycle of records, from production to dissemination, in opposition to the sterile distinction advocated by traditional archivists and document managers. In my opinion, however, the best approach to integrating information management is known as records continuum, which places archives in a post-custodial, informational, and scientific paradigm. This Australian concept arose in the 1990s amid the huge explosion of information, communication technologies and new media. This context forced Information Science to redefine its object of study. Records continuum is closely related to the integrated management model of Couture and Rousseau, while it carries their innovation further, perfecting it and replacing it with systemic dynamics and providing continuity between archives. In fact, records continuum means, literally, continuous management. It looks at the whole process from the production of records to their final archiving. Otherwise, we cannot speak of continuous management. That is why, when we speak of rigid archives – current, intermediate, and definitive, this approach is more theoretical than practical. There is, in fact, no separation between these phases, even less so from the point of view of the value of documents. The

traditional distinction between information with probative and historical value ceases to exist. The information is simultaneous and is, in fact, the same.

Bio: Paulo Batista is PhD Researcher at CIDEHUS.UÉ-Interdisciplinary Center for History, Cultures and Societies of the University of Évora, Portugal, where is the coordinator of the research group2: Heritage and Literacies. Currently works as professor at the Iscte-IUL, in the Master in Architecture and Visual Culture in Lisbon, and at the Autonomous University of Lisbon, where is coordinator and professor of the Postgraduate in Promotion and Cultural and Educational Dynamization of Archives and Libraries, and the Postgraduate in Architectural Archives.

Invited Speaker

Mar. 2, Sunday, 15:45-16:10, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Prof. Jyotsna Kumar Mandal

University of Kalyani, India

Speech Title: Automated Confidence Based Learning and Assessment

Abstract: In this lecture the requirements for development of a system that will promote CBL with an architecture of the same. Existing methods, techniques, and models available in the field of e-learning or TEL are studied and presented and the research gap has been formulated. Moreover. The talk stressed upon the requirement of an enhanced learning content development framework and augmented assessment methodology. In proceeding through the lecture it became evident that as the CBL is concerned with the world of work, input from the jobsite is of immense importance in establishing the performances and adequacies of the learners. Learning Record Store (LRS) are used to identify the adequacies and in promoting the customized content development. The customization of the content and prescribing it to the learner is also important and a method to be discussed in this area. There is a requirement of monitoring the performance of learning method will be discussed.

Bio: Dr. Jyotsna Kumar Mandal, M. Tech. in Computer Science from University of Calcutta in 1987, awarded Ph. D. (Engineering) in Computer Science and Engineering by Jadavpur University in 2000. Working as Professor of Computer Science & Engineering, University of Kalyani. Former Vice Chancellor, Raiganj University, West Bengal, Former Dean, Faculty of Engineering, Technology & Management, KU for two consecutive terms during 2008-2012. Former Director, IQAC and Chairman CIRM Kalyani University. Served as Professor Computer Applications, Kalyani Government Engineering College for two years. He was Associate Professor Computer Science for eight years at North Bengal University and Assistant Professor Computer Science North Bengal University for seven years. He also served as lecturer at NERIST, Itanagar for one year. 36 years of teaching and research experience in Coding Theory, Data and Network Security and authentication; Remote Sensing & GIS based Applications, Data Compression, Error Correction, Visual Cryptography and Steganography. Awarded 30 Ph. D. Degrees and 8 are pursuing. Supervised 03 M. Phil, more than 80 M. Tech and more than 130 M.C.A. Dissertations. Published more than 450 research articles. Recently he has published a text book on Reversible Steganography and Authentication via Transform Encoding from Springer (<https://link.springer.com/book/10.1007/978-981-15-4397-5>). This book has been translated into Chinese and republished from China by Springer. Organized more than 60 International Conferences and Corresponding

Editors of edited volumes and conference publications of Springer, IEEE and Elsevier etc. and edited 60 volumes as volume editor. Received "Shiksha Ratna" Award from Government of West Bengal, India for outstanding teaching and research work in 2018. ISO world Convenor of ISO/IEC JTC 1/SC36/WG7. Governing Council(GC) Member of IETE, India.

Invited Speaker

Mar. 2, Sunday, 10:20-10:45, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Prof. Chuan-Ming Liu

National Taipei University of Technology, Taiwan

Speech Title: Learned Indices for Spatial Data

Abstract: An index is a structure or organization on data for effectively managing data item in terms of time and space, such as hash tables, binary search trees, and B-trees. As the properties and types of data change over time, new appropriate indices for efficient management on data become more and more important and necessary. On the other hand, as the techniques of machine learning or deep learning advance, many applications using machine learning for a better performance have been explored. Recall the idea and objective of an index. The index now can be seen as a model in machine learning, which can locate the data item effectively by prediction. With this observation, a learned index, a model that considers the patterns and distributions of data, has been proposed to facilitate search processing. Some learned indices have been provided for one-dimensional data, including Range Index and Recursive Model Index (RMI). For multi-dimensional (or spatial) data, it is always a challenging work to have effective index structures. Some well-known spatial indices, like kd-trees, quad-trees, and R-trees, with their variants for improvement on the efficiency have been studied till now. It thus is interesting and worthy to study the learned indices on spatial (multi-dimensional) data for a better performance. In this talk, the learned indices will be introduced starting with the ones for one-dimensional data. We then focus on the learned indices for spatial data and present our learned indices based on index tree structures. With the learned indices as models, evaluation on preprocessing, training, prediction, error, as well as query processing for point, range and kNN queries will be addressed as well.

Bio: Dr. Chuan-Ming Liu is a professor in the Department of Computer Science and Information Engineering (CSIE), National Taipei University of Technology (Taipei Tech), TAIWAN, where he was the Department Chair from 2013-2017. He received his Ph.D. in Computer Science from Purdue University in 2002 and joined the CSIE Department in Taipei Tech in the spring of 2003. In 2010 and 2011, he has held visiting appointments with Auburn University, Auburn, AL, USA, and the Beijing Institute of Technology, Beijing, China. He has services in many journals, conferences and societies as well as published more than 120 papers in many prestigious journals and international conferences. Dr. Liu was also the co-recipients of the best paper awards in many

conferences, including ICUFN 2015, ICS 2016, MC 2017, WOCC 2018, MC 2019, WOCC 2021, TCSE 2022, and TANET 2023. His current research interests include data science, big data management, uncertain data management, spatial data processing, data streams, ad-hoc and sensor networks, location-based services.

Invited Speaker

Mar. 1, Saturday, 14:00-14:25, GMT+8, Beijing Time

Meeting Room: 6F- Room W613



Prof. Yingwah Teh

University of Malaya, Malaysia

Speech Title: Modern Data Mining in Information Systems: A 2025 Perspective

Abstract: This talk examines the role of modern data mining techniques in advancing information systems, with a focus on enhancing property developer experiences. As data generation grows exponentially, data mining has become critical for optimizing systems, improving security, and enabling intelligent, real-time decision-making. Key techniques such as machine learning, clustering, and anomaly detection are applied to improve resource allocation and system efficiency in distributed and cloud-based environments. We also share our experience in developing data-driven solutions for the property development sector, addressing challenges like data privacy and scalability while exploring trends such as AI-driven analytics and edge computing.

Bio: As a highly accomplished computer scientist and data mining expert with over 35 years of experience, he has demonstrated exceptional leadership, expertise, and vision in the field.

Over the course of my career, he has achieved numerous successes and made significant contributions to the industry. He began as an entry-level computer programmer in 1988 and advanced to become a Professor of Data Mining at the Faculty of Computer Science and Information Technology at the University of Malaya. He obtained my tertiary academic qualifications from Oklahoma City University and the University of Malaya, and he has published more than 90 academic papers in top-tier journals, including Information Fusion and the International Journal of Information Management.

He has a remarkable H-index and number of citations in Web of Science, Scopus, and Google Scholars databases, and he has supervised numerous students at all levels of study. His areas of research include data warehouse, data mining, deep learning, IoT, activity recognition, wearable sensors, accelerometers, heart arrhythmia, electrocardiograph, supraventricular premature beat, multivariate time series, edge computing, task scheduling, data streams, mobile computing, speaker verification, language recognition, clustering algorithms, MapReduce, stock market, and sentiment analysis.

He has received several grants of more than RM one million, including public, international, and private grants, and he has completed two commercial data science projects for Petronas GTD and Air Liquide. I serve as an Associate Editor for Human-Media Interaction – Frontiers in Psychology and a reviewer for several high-quality journals. I am also an Expert Advisory Panel for Master of Science (Data Science) Degree Program at UTP,

Programme Advisory Panel for Bachelor of Business (Honors) in Business Analytics at TARUC, and an external assessor of Swinburne University of Technology (BS of Computer Science program). Additionally, he is an External Assessor for Programme Master Sciences (Computer and Information Engineering), IIUM, and a technical assessor of Swiss National Science Foundation.

He has been teaching data mining since 2002, and has produced many highly qualified data scientists and Ph.D. graduates who have gone on to work for top companies like IBM, Amazon Web Services, and Google.

As a highly respected and accomplished computer scientist, he has demonstrated exceptional dedication to the industry, and I am confident that my expertise, leadership, and vision make me a highly qualified computer scientist.

Invited Speaker

Mar. 2, Sunday, 13:25-13:50, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Assoc. Prof. Rohaya Binti Latip

Universiti Putra Malaysia, Malaysia

Speech Title: Task Offloading Optimization Algorithm for Time-Energy Minimization in Mobile Edge Computing

Abstract: Mobile edge computing (MEC) is a promising technology that enhances computational capacity and reduce the latency at the edge of mobile networks, yet task offloading in edge computing remains challenging due to its dynamic configurations and the significant resource requirements involved. Existing literature has made strides in addressing these issues; however, many solutions fail to adequately consider the optimal selection of tasks and their inherent dependencies, which are crucial for efficient offloading. Therefore, this paper proposed a weighted quantum particle swarm and dispatched task offloading problem in mobile edge computing as a multi-objective function aimed at minimizing both energy consumption and task completion time. We introduce a novel weighted quantum particle swarm optimization with Dispatched (WQPSOD) task offloading optimization algorithm designed to enhance performance in mobile edge computing environments. The WQPSOD algorithm is implemented in Python and evaluated in a multi-user, multi-server context. Our experimental results demonstrate that WQPSOD significantly outperforms benchmark algorithms, by achieving 60.88% and 51.10% improvement in task completion time and system energy consumption respectively.

Bio: She is currently an Associate Professor at the Department of Communication Technology and Network, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia. She holds a Ph. D in Distributed Database and Msc. in Distributed System from Universiti Putra Malaysia. She graduated her Bachelor of Computer Science from University Technology Malaysia, Malaysia. She was the head of Department of Communication Technology and Network from 2017 until 2022. She served as an Associate Professor at Najran university, Kingdom of Arab Saudi from 2012 until 2013. She was the Head of HPC section in Universiti Putra Malaysia (2011-2012) and consulted the Campus Grid project and the Wireless for hostel in Campus UPM project. Her research interests include Big Data, Cloud, Fog and Edge Computing, Network management, and Distributed database. She has published more than 140 papers in international and national journals, proceedings and posters.

Invited Speaker

Mar. 2, Sunday, 13:50-14:15, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Assoc. Prof. Teoh Ai Ping

Universiti Sains Malaysia, Malaysia

Speech Title: Predicting Cybersecurity Behaviour among Professionals in Malaysia

Abstract: This paper explores the factors influencing cybersecurity behavior among accounting professionals in Malaysia by integrating Protection Motivation Theory (PMT) and Technology Threat Avoidance Theory (TTAT). Using a survey-based approach, data were gathered from 285 professionals through an online questionnaire, with 260 valid responses analyzed using SmartPLS. The findings reveal that perceived severity and rewards significantly impact perceived threat, whereas perceived vulnerability does not show a direct effect. Protection motivation is directly influenced by perceived threat and self-efficacy, while response cost does not have a significant impact. Moreover, protection motivation serves as a key mediator between perceived threat and self-efficacy in shaping cybersecurity behavior but does not mediate response cost. Cybersecurity awareness moderates the impact of response cost but not perceived threat or self-efficacy, whereas safeguard effectiveness negatively moderates the relationship between protection motivation and cybersecurity behavior. This study enriches the existing literature by examining the interplay between perceived threat, response cost, self-efficacy, protection motivation, and cybersecurity behavior, offering valuable insights for researchers, practitioners, and policymakers to enhance cybersecurity practices in professional settings.

Bio: Associate Professor Ts. Dr. Teoh Ai Ping currently serves as the Deputy Dean (Research, Innovation, Industry Community Engagement) at the Graduate School of Business, Universiti Sains Malaysia. She holds a Doctor of Business Administration, Master of Science (Information Technology) and Bachelor of Accountancy (Hons.). Ts. Dr. Teoh is a Professional Technologist (Cyber Security Technology) with the Malaysian Board of Technologists and a Certified Risk and Compliance Management Professional with the International Association of Risk and Compliance Management Professionals. She is also a member with the Malaysian Institute of Accountants, the Institute of Internal Audit, Malaysia and Association of Certified Fraud Examiners and member with Association of Computing Machinery and Institute of Electrical and Electronic Engineers. With a background in both accounting and information systems technology sector, she began her career as an account executive

in the EMS industry and then transitioning to consulting in SAP R/3 Enterprise Resource Planning system specializing in the Financial and Controlling; as well as ABAP/4 programming and SAP Scripts. Ts. Dr. Teoh eventually embarked on a career in the academic sector as a Deputy Dean School of Business Administration in a private University before joining GSB USM. Ts. Dr. Teoh has served as external assessor and subject matter expert in several accounting and business programs and being external examiner for Doctoral theses evaluation. Ts Dr. Teoh has successfully completed several consultancy and corporate training projects to clients in the areas related to Business Information Systems in Malaysia and abroad. She has a widespread publication record, with articles featured in both local and international journals; and delivered speeches at various international conferences and industry events as Invited Speaker and Keynote Speaker. Her areas of interests include enterprise information systems, enterprise risk management systems, cyber security, and business sustainability.

Invited Speaker

Mar. 1, Saturday, 14:25-14:50, GMT+8, Beijing Time

Meeting Room: 6F- Room W612



Assoc. Prof. Tze Wei Liew

Multimedia University Malaysia

Speech Title: A Socio-Communicative Approach to Designing AI Systems

Abstract: As artificial intelligence (AI) systems become increasingly integrated into everyday interactions, their ability to engage users socially and communicate effectively is crucial. In this session, I will discuss the role of social cues in AI design, drawing from insights in human-agent interaction, communication theories, and the computers-are-social-actors paradigm. I propose a model that outlines how demographics, appearance, social prestige, specialization, communication style, and information quality (DASSCI model) shape users' perceptions of AI competence and trustworthiness. By strategically embedding these socio-communicative elements, AI systems—whether embodied virtual agents, chatbots, or voice assistants—can enhance engagement, credibility, and user acceptance. This presentation will explore socio-communicative models for designing socially intelligent AI and its implications across education, healthcare, and e-commerce. The session aims to bridge theoretical frameworks with practical AI design strategies, offering insights for researchers and developers working on next-generation AI systems.

Bio: Tze Wei Liew is an Associate Professor of Information Science attached to the Centre for Interaction and Experience Design and the Faculty of Business at Multimedia University (MMU), Malaysia, specializing in teaching information systems and sciences to undergraduate and postgraduate students. His research interests and contributions in WoS and Scopus-indexed publications focus on human-media and human-agent interaction, with an emphasis on educational, instructional, media, and cyberpsychology. A member of the Association for Computing Machinery (ACM), he also serves on the editorial boards of journals, including Elsevier's Learning and Instruction and Wiley's Human Behavior and Emerging Technologies. He has actively collaborated on research presentations, lectures, and activities at international scholarly conferences and venues such as Australia, China, Cambodia, Denmark, India, Indonesia, Japan, Portugal, Singapore, Spain, Sweden, Taiwan, Thailand, and Vietnam, while serving as a Technical Program Committee (TPC) member and program chair for ACM and IEEE conferences in information sciences.

Invited Speaker

Mar. 2, Sunday, 16:10-16:35, GMT+8, Beijing Time

ZOOM Link: <https://us02web.zoom.us/j/86442784183>

Zoom ID: 864 4278 4183

Password: 202502



Dr. Chiagoziem Chima Ukwuoma

Chengdu University of Technology, China

Speech Title: Enhancing Solar GHI Forecasting with Dual-Input Features and Lightweight Transformer Models

Abstract: Accurate Global Horizontal Irradiance (GHI) forecasting is essential for efficient solar energy management. Traditional statistical models such as ARIMA and numerical weather prediction (NWP) models, though interpretable, struggle with capturing the nonlinear dependencies and rapid weather variations affecting solar radiation. Deep learning models, including Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, have improved forecasting by leveraging spatial and temporal patterns. However, CNNs lack temporal awareness, while LSTMs suffer from high training costs and vanishing gradient issues. Transformer models have recently emerged as a powerful alternative, effectively capturing long-range dependencies through self-attention mechanisms. However, their high computational complexity limits their practicality in real-time applications. Another major challenge in GHI forecasting is data modality. Numerical weather data, such as temperature, humidity, and wind speed, provide useful meteorological insights but lack spatial granularity. Conversely, image-based models utilizing sky or satellite images offer spatial awareness but demand extensive storage and computational resources. Relying solely on either numerical or image-based inputs restricts forecasting accuracy and robustness.

We propose the design and application of dual-input lightweight transformer models that can integrate numerical weather data with sky image features to enhance forecasting accuracy while minimizing computational overhead. A CNN encoder extracts spatial features from sky images, while numerical weather features are processed through a dedicated transformer branch. The model employs a self-attention mechanism to effectively combine both data sources, capturing intricate spatial-temporal dependencies. Experimental results demonstrate that the proposed approach outperforms statistical models, standalone CNNs, and conventional transformer models in short- and medium-term GHI forecasting. The fusion of numerical and image-based data significantly improves predictive accuracy, while the lightweight transformer architecture ensures computational efficiency, making it viable for real-time deployment in solar energy management systems. This study underscores the importance of hybrid deep learning architectures in advancing solar forecasting, contributing to a more stable and efficient renewable energy grid.

Bio: Dr. Chima holds a Bachelor of Engineering in Mechanical Engineering (Automotive Technology) from the Federal University of Technology Owerri (FUTO), Nigeria, a Master of Science in Software Engineering, and a Doctor of Philosophy in Software Engineering, both from the University of Electronics Science and Technology of China (UESTC). He is currently a Senior Lecturer and Senior Researcher at OBU, Sino-British Collaborative Education, Chengdu University of Technology, China. Dr. Chima has published over 70 peer-reviewed papers in Top journals including Journal of Applied Energy, Renewable Energy, Biomedical Signal Processing and Control, International Journal of Hydrogen Energy, Computers in Biology and Medicine, Social Science and Medicine, Science of Total Environment, Biocybernetics and Biomedical Engineering, Clean Energy, Expert Systems and Application and lots more. He serves as an academic judge for the United States Academic Decathlon & Pentathlon (USAD & USAP) China and the National Economics Challenge (NEC) since 2019 and has been recognized with several prestigious awards, including the Centre for West African Studies of UESTC Doctoral Research Fund.

Invited Speaker

Mar. 1, Saturday, 14:25-14:50, GMT+8, Beijing Time

Meeting Room: 6F- Room W613



Jackey Cheung

The Chinese University of Hong Kong, Hong Kong, China

Speech Title: An adaptive auto-tuning Healthcare system development in Hyperledger Besu Blockchain

Abstract: Blockchain (BC) is widely regarded as one of the most groundbreaking technologies in this decade, distinguished by its key attributes of decentralization, security, and accessibility. In this presentation, we aim to share our insights and experiences in examining the performance characteristics of Blockchain applications within Healthcare IoT (IoHT). Our focus will be on critical metrics such as transaction throughput, latency, and resource utilization.

We will also discuss our approach to designing comparative experiments, considering parameters such as transaction send rate, block size, consensus mechanisms, and block time; and our investigation of the proof of authority consensus algorithms—namely QBFT, IBFT 2.0, and Clique, which was conducted using Hyperledger Caliper. We will analyze how these parameters influence the performance of a private Hyperledger Besu blockchain.

Building on our findings, we have delved into the development of our proposed Hyperledger Besu auto-tuning system, which employs a tunnel-limiter to guide the system toward optimal operational conditions. This leads us to our adaptive BC-parameter-tunable Decentralized framework for IoHT (ABCD-IoHT), designed to enhance the throughput performance of medical healthcare systems while ensuring robust security under varying medical load conditions.

Bio: Jackey Cheung is affiliated with the Department of Computer Science and Engineering. He has 15+ years teaching experience in CS/IT area in Universities; and he has taught many courses such as Blockchain, Artificial Intelligent, Cyber Security, Machine Learning, Computer Programming, Data Structures and Algorithms, Database Systems, Information Retrieval, Computer Graphics, Software Engineering, Software Management, Digital Literacy and Computational Thinking, etc. in University UG-Level and Master-Level.

His research interests: blockchain, artificial intelligent, cyber security, deep learning, virtual reality, computer vision, etc.

He likes sports (University-team-member), photography (advisor with photo-albums), traveling (exploring places like Iceland, Yellowknife, etc.), scuba-diving (advanced-diver), windsurfing, k-boating, archery, driving (in-training-pilot), reading (esp. history), HiFi-music, strategy-gaming, programming, and making new things [Welcome to join me if you have similar interest~].

Conference Schedule

Day 1- Feb. 28, 2025, Friday, GMT+8, Beijing Time

Onsite Registration

Time	Event	Venue
13:00-17:00	Onsite Sign-in	Hong Kong Chu Hai College's First floor lobby 香港珠海学院一楼大厅

Online Test

Time	Presenters	ZOOM ID
9:30-11:30	Committee Members, Keynote Speakers (Online), Invited Speakers (Online), and Session Chairs (Online)	879 1375 4699 Password: 202502
14:00-16:00	Online Presenters: CS1049, CS1014, CS1024, CS1018, CS1046, CS1045, CS1051, CS1029, CS1030, CS1025, CS2007, CS1028, CS1034, CS1022	879 1375 4699 Password: 202502

Online Test Tips:

- ✧ Please get your presentation file ready for the pretest.
- ✧ Please unmute audio and start video while your presentation.
- ✧ It's suggested to use headset with microphone or earphone with microphone.

Day 2- Mar. 1, 2025, Saturday, GMT+8, Beijing Time

Opening Ceremony, Keynote Speeches

1. Onsite Meeting Room–6F - Room W612, W613
2. Online Zoom Room:
812 7936 5872 / <https://us02web.zoom.us/j/81279365872>
Password: 202502

09:00-09:05	Welcome Message Prof. Yew Kee WON G Eric, Hong Kong Chu Hai College, China
09:05-09:10	Opening Remarks Prof. Sergei Gorlatch, University of Muenster, Germany
09:10-09:50	Keynote Speech I Prof. Sam KWONG Tak Wu, Lingnan University, Hong Kong, China <i>Fellow of IEEE, Fellow of the US National Academy of Innovators</i> <i>Fellow of the Hong Kong Academy of Engineering and Sciences</i> <i>Chair Professor of Computational Intelligence, Associate Vice-President (Strategic Research) of Lingnan University</i> Speech Title: Creating a Better Future: Harnessing AI for Social and Environmental Responsibility
9:50-10:30	Keynote Speech II Prof. Qingfu Zhang, City University of Hong Kong, Hong Kong, China <i>Fellow of IEEE</i> <i>Chair Professor of Department of Computer Science, City University of Hong Kong, Hong Kong, China</i> Speech Title: Evolution of Heuristics: Towards Efficient Automated Algorithm Design Using Large Language Models
10:30-11:00 (First Floor's Cafeteria)	Group Photo & Coffee Break
11:00-11:40	Keynote Speech III Prof. Francis Chin, University of Hong Kong, China <i>Fellow of IEEE, HKIE and HKACE</i> <i>Emeritus Professor of University of Hong Kong, China</i> Speech Title: Development and Future of Deep Learning
11:40-12:20	Keynote Speech IV Prof. Wai Lun LO, Hong Kong Chu Hai College, China <i>Head of Department of Computer Science</i> <i>Director of Research and Curriculum Innovation</i> Speech Title: Image based meteorological visibility estimation by using ANN
12:20-14:00 (First Floor's Cafeteria)	Lunch & Break

Onsite Sessions

14:00-17:10	6F Room W612	<p>Onsite Session 1-AI-based integrated information system and software development</p> <p>Session Chairs:</p> <p>Prof. Koen Smit, HU University of Applied Sciences Utrecht, The Netherlands</p> <p>Prof. Moirangthem Marjit Singh, Department of Computer Science and Engineering, North Eastern Regional Institute of Science and Technology, Arunachal Pradesh, India</p> <p>Invited Speaker: Prof. Koen Smit, HU University of Applied Sciences Utrecht, The Netherlands</p> <p>Invited Speaker: Assoc. Prof. Tze Wei Liew, Multimedia University Malaysia</p> <p>CS1020, CS1019, CS1015, CS1036, CS1011, CS1021, CS2009-A, CS1022</p>
14:00-17:25	6F Room W613	<p>Onsite Session 2 –Wireless communication and intelligent image analysis</p> <p>Session Chair: Prof. Yingwah Teh, University of Malaya, Malaysia]</p> <p>Invited Speaker: Prof. Yingwah Teh, University of Malaya, Malaysia</p> <p>Invited Speaker: Jackey Cheung, The Chinese University of Hong Kong, Hong Kong, China</p> <p>CS1031-A, CS1048, CS1042, CS2004, CS1040, CS2006, CS1027, CS1002, CS1001</p>
15:35-15:55	<p>Coffee Break (First Floor's Cafeteria)</p> <p>Poster Presentation: CS1040</p>	
18:00	Dinner	

Day 3 – Mar. 2, 2025, Sunday, GMT+8, Beijing Time

Online Sessions

09:30-11:45	<p>ZOOM ID 864 4278 4183</p> <p>https://us02web.zoom.us/j/86442784183</p> <p>Password: 202502</p>	<p>Online Session 1–Data-oriented information system design and security certification</p> <p>Session Chair: Prof. Hong Lin, University of Houston-Downtown, USA</p> <p>Invited Speaker: Prof. Hong Lin, University of Houston-Downtown, USA</p> <p>Invited Speaker: Prof. Paulo Batista, University of Évora, Portugal</p> <p>Invited Speaker: Prof. Chuan-Ming Liu, National Taipei University of Technology, Taiwan</p> <p>CS1049, CS1014, CS1024, CS1018</p>
11:45-13:00	Lunch & Break	
13:00-15:30	<p>ZOOM ID 864 4278 4183</p> <p>https://us02web.zoom.us/j/86442784183</p> <p>Password: 202502</p>	<p>Online Session 2–Data center network, network security and signal transmission</p> <p>Session Chair: Prof. Ghulam Abbas, GIK Institute of Engineering Sciences and Technology, Pakistan</p> <p>Invited Speaker: Prof. Ghulam Abbas, GIK Institute of Engineering Sciences and Technology, Pakistan</p> <p>Invited Speaker: Assoc. Prof. Rohaya Binti Latip, Universiti Putra Malaysia, Malaysia</p> <p>Invited Speaker: Assoc. Prof. Teoh Ai Ping, Universiti Sains Malaysia, Malaysia</p> <p>CS1046, CS1045, CS1051, CS1029, CS1030</p>
15:30-15:45	Break	
15:45-17:35	<p>ZOOM ID 864 4278 4183</p> <p>https://us02web.zoom.us/j/86442784183</p> <p>Password: 202502</p>	<p>Online Session 3–Image-based detection model and intelligent computing</p> <p>Session Chair: Assco Prof. Rhodessa Cascaro, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Invited Speaker: Prof. Jyotsna Kumar Mandal, University of Kalyani, India</p> <p>Invited Speaker: Dr. Chiagoziem Chima Ukwuoma, Chengdu University of Technology, China</p> <p>CS1025, CS2007, CS1028, CS1034</p>

Poster Presentation

Time: 15:35-15:55 (GMT+8, Beijing Time), Mar.1, Saturday

Venue: Onsite Meeting Room-6F - Room W612

CS1040

Title: Motor Imagery EEG Classification Based on Adaptive Weighted Multi-subject Sampling

Authors: Huiyang Wang and Haixian Wang

Presenter: Huiyang Wang, School of Biological Science & Medical Engineering Southeast University Nanjing, China

Abstract: Single-subject motor imagery (MI)-based Electroencephalogram (EEG) data is often insufficient, leading to overfitting in deep learning models. Leveraging EEG data from other subjects to improve the classification accuracy for the target subject is a viable approach. However, due to significant distribution discrepancies across subjects' EEG data, increasing the training data can sometimes paradoxically decrease the classification accuracy for the target subject. Experimental results reveal that not all multi-subject samples yield positive benefits. This paper proposes an adaptive weighted multi-subject sampling (AWMS) method to utilize beneficial samples and minimize interference from detrimental ones. This method calculates the distances between the feature vectors of the multi-subject samples and those of the target subject. The weights of the multi-subject samples are then determined based on these distances: the larger the distance, the smaller the weight, and vice versa. The subject-specific MI-based EEG classification performance demonstrates the advantages of the AWMS method. For example, using EEGNet as the backbone, AWMS achieved an 83.22% state-of-the-art classification accuracy on the BCI Competition IV 2a (BCICIV-2a) dataset.

Onsite Session 1 (Special Session)

Topic: AI-based integrated information system and software development

Session Chair:

Prof. Moirangthem Marjit Singh, North Eastern Regional Institute of Science & Technology (NERIST), India

Prof. Koen Smit, HU University of Applied Sciences Utrecht, Netherlands

Time: 14:00-17:10 (GMT+8, Beijing Time), Mar. 1, Saturday

Venue: Hong Kong Chu Hai College, 6F - Room W612

<p>Invited Speaker</p> <p>14:00-14:25</p>	<p>Title: Applied Research into Digital Twinning to Support the Policy Lifecycle and Spatial Planning by Regional and Local Governments in the Netherlands</p> <p>Invited Speaker: Prof. Koen Smit, HU University of Applied Sciences Utrecht, Netherlands</p> <p>Abstract: An increasing number of Dutch provinces and municipalities are engaged in the experimentation of Digital Twin technology, which involves the creation of digital replicas of regions, areas, cities, and neighborhoods. The ultimate objective is to support policy development and spatial planning practices. Digital Twins hold significant promise due to their capacity to incorporate and combine various areas of interest, such as biodiversity, mobility, heat stress, flood risk, sound levels, and more, within a dynamic digital (3D) environment. Digital Twins also enable real-time manipulation of variables pertaining to these areas of interest.</p> <p>At present, numerous independent initiatives involving Digital Twin technology are being pursued by Dutch provinces and municipalities; however, a lack of adequate collaboration exists among them. The Digital Twins lab at HU University of Applied Sciences Utrecht aims to build and facilitate extensive cooperation among these Dutch provinces and municipalities. To achieve this, the lab conducts research on various aspects, including legal, technical, governance, and ethical considerations.</p> <p>This presentation will primarily focus on the structure and functioning of the Digital Twins lab, the outcomes attained through our studies, and the valuable insights gained from multiple (applied) research studies.</p>
<p>Invited Speaker</p> <p>14:25-14:50</p>	<p>Title: A Socio-Communicative Approach to Designing AI Systems</p> <p>Invited Speaker: Assoc. Prof. Tze Wei Liew, Multimedia University Malaysia</p> <p>Abstract: As artificial intelligence (AI) systems become increasingly integrated into everyday interactions, their ability to engage users socially and communicate effectively is crucial. In this session, I will discuss the role of social cues in AI design, drawing from insights in human-agent interaction, communication theories, and the computers-are-social-actors paradigm. I propose a model that outlines how demographics, appearance, social prestige, specialization, communication style, and information quality (DASSCI model) shape users' perceptions of AI competence and trustworthiness. By strategically embedding these socio-communicative elements, AI systems—whether embodied virtual agents, chatbots, or voice assistants—can enhance engagement, credibility, and user acceptance. This presentation will explore socio-communicative models for designing socially intelligent AI and its implications across education, healthcare, and e-commerce. The session aims to bridge theoretical frameworks with practical AI</p>

	design strategies, offering insights for researchers and developers working on next-generation AI systems.
CS1020 14:50-15:05	<p>Title: A Preliminary Ontology for 5G Network Security: Hybrid Threats, Risk Reduction, Compliance</p> <p>Author: R. Andrew Paskauskas</p> <p>Presenter: R. Andrew Paskauskas, Lithuanian Cybercrime Center of Excellence for Training, Research, and Education (L3CE), Lithuania</p> <p>Abstract: The increasing reliance on 5G networks as critical infrastructure across Europe, particularly along the EU's transport corridors, underscores the importance of securing these systems against hybrid threats. This paper presents a preliminary ontology for 5G network security, designed to model and mitigate hybrid threats while ensuring regulatory compliance with the European Commission's cybersecurity requirements. Grounded in the ENISA 5G Threat Landscape and ISO 27005 risk management standards, the ontology integrates critical concepts such as assets, threats, risks, and mitigation strategies. It enables systematic risk reduction through iterative validation using SHACL constraints and logical reasoning via Protégé's HermiT reasoner. A detailed case scenario demonstrates the ontology's adaptability in addressing emerging risks, such as attacks on NG-RAN, SDN, and cloud-based infrastructure, while supporting compliance with Connecting Europe Facility (CEF) mandates, including high-risk supplier management and data security. This work lays a foundation for deploying scalable, resilient, and adaptable 5G systems by bridging conceptual modelling with real-world compliance requirements. Future directions include testing the ontology in real-world testbeds to validate its robustness and applicability further.</p>
CS1019 15:05-15:20	<p>Title: Benchmarking of Neural Ordinary Differential Equations</p> <p>Authors: Aanchal Narendran, Kartika Nair, Rajasekar Mohan, Saahil Jain and Sujith K</p> <p>Presenter: Rajasekar Mohan, PES University, India</p> <p>Abstract: The agenda of this work is to draw a comparison between Neural Ordinary Differential Equations (NODE) and other Machine Learning algorithms. NODE is a machine learning algorithm proposed in 2018, a new family of deep neural network models. To assess the performance of NODE, we have conducted a comparative study of it against other models, such as Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) Cells, and Gated Recurrent Units (GRUs) for Time Series Forecasting, and Convolutional Neural Networks (CNNs), Transfer Learning, and Residual Neural Networks (ResNets) for Image Processing. In the case of Time Series prediction, all the models were trained on the same dataset, which records the daily number of COVID-19 cases and deaths in every country. All models were trained on the standard MNIST and CIFAR-10 datasets for Image Processing. From the work done in this paper, it was determined that NODE gives comparable results, while performing a trade-off between accuracy and time. Additionally, when added onto CNNs for training purposes, a significant improvement was seen in the accuracy, and the loss was reduced by a reasonable amount.</p>
CS1015 15:20-15:35	<p>Title: Selecting Suitable Value Sensitive Design Routines</p> <p>Authors: Johan Versendaal, Marlies van Steenberg, Koen Smit, Stan van Ginkel, Mirjam de Haas, Sam Leewis, John van Meerten, Annemae van de Hoef, Bo Sichterman, Rob Peters, Shanna Govers, Ildikó Vajda</p> <p>Presenter: Koen Smit, HU University of Applied Sciences Utrecht, the Netherlands</p>

	<p>Abstract: Information Systems & Information Technology (IS/IT) development, including its implementation, has evolved from merely realizing automation and providing management information to strategic management tooling, e.g. by deploying data-driven and Artificial Intelligence (AI) solutions. The increasing strategic direction of IS/IT development has also increased attention to its impact on human values. Scholars have defined different routines (method fragments) for paying attention to human values in IS/IT development, but how to combine the fragments, how to include those in existing IS/IT development methods, and when to apply which method fragment in what situation is often not obvious. To address this, we aimed for 1) the identification of situational descriptors of method fragments that address human values and 2) the determination of the possible attribute values of situational descriptors. From the literature, we thematically coded the descriptions and supporting studies of seventeen Value Sensitive Design (VSD) method fragments as mentioned by [1], identifying the situational descriptors in terms of 1) the purpose for which the method fragment could be re-used (the reuse intention) and 2) the context for reuse (the reuse context criteria). With their identification and associated attribute values, we provide method engineers with a means to select method fragments that explicitly address human values for a specific IS/IT development project, leading to human-computer interactions that better respect social values. We provide the VSD community with metadata for situationally applying VSD method fragments timely. Future research is encouraged by further validating the reuse intentions and reuse context criteria (and their attribute values) of the VSD method fragments through case studies. Moreover, as new and other method fragments that address human values emerge, it is encouraged to include those in the list of existing VSD method fragments with their identification and attribute values for their reuse intention and reuse context criteria.</p>
15:35-15:55	Coffee Break (First Floor's Cafeteria)
CS1036 15:55-16:10	<p>Title: Human-AI Collaboration for System Synthesis in Financial Forecasting: A Feasibility Study Author: Ka Ching Chan Presenter: Ka Ching Chan, University of Southern Queensland, Australia</p> <p>Abstract: This paper explores the feasibility of using Gen- erative AI, specifically tools like ChatGPT, for synthesizing a modular financial forecasting system. By leveraging human-AI collaboration, the study identifies and integrates key components such as sentiment analysis engines, AI/ML prediction models, historical databases, and backtesting frameworks from multiple research papers. The proposed system employs a hybrid ap- proach, combining modular design principles and component- based architecture, to enable scalability, adaptability, and inde- pendent development. The paper outlines a high-level system ar- chitecture, using APIs and pipelines for communication between components, and concludes with a discussion on the challenges and opportunities in AI-assisted system design, data integration, and advanced sentiment analysis. This work demonstrates how Generative AI can be leveraged to design innovative, collaborative research frameworks and systems.</p>
CS1011 16:10-16:25	<p>Title: Forecasting Water Consumption in Davao City: A Comparative Study of SARIMAX, Prophet, XGBoost, LSTM, and Multivariate Ensemble Models with Applied Particle Swarm Optimization Authors: Prince Grant Stalen Oncada, Estelle Maria Montiel, John Marco Montano, Christopher</p>

	<p>Josh Lao Dellosa</p> <p>Presenter: Christopher Josh Dellosa, Mapúa Malayan Colleges Mindanao, Philippines</p> <p>Abstract: Water is essential for life as it plays a critical role in agriculture, municipalities, and industries. However, rapid industrialization and population growth in Davao City, Philippines, have led to increased water demand, with many citizens facing challenges in water availability. Accurate water consumption forecasting is crucial for predicting demand, facilitating effective resource allocation, and promoting sustainable consumption. This study compared the performance of SARIMAX, Prophet, XGBoost, LSTM, and multivariate ensemble models in forecasting water consumption. The first step involved training individual models—SARIMAX, Prophet, XGBoost, and LSTM—before stacking them to create a multivariate ensemble model. The second step involved optimizing these models using Particle Swarm Optimization (PSO). Finally, the models' accuracy was evaluated using error metrics, including MSE, RMSE, MAE, and MAPE, to identify the best-performing model. Based on the results, the XGBoost model emerged as the top performer, surpassing the ensemble and all other models, indicating that while ensemble learning offered improvements before optimization, an optimized individual model like XGBoost can achieve better accuracy. The study's beneficiaries included local government agencies, educational institutions, and residents. Additionally, the findings aligned with the United Nations' Sustainable Development Goals, particularly those focused on clean water and responsible consumption.</p>
<p>CS1021</p> <p>16:25-16:40</p>	<p>Title: An Ensemble Unsupervised Learning based Approach to Detect Zero-Day Attack</p> <p>Authors: Moirangthem Marjit Singh and Bikrant Chhetry</p> <p>Presenter: Prof. Moirangthem Marjit Singh, North Eastern Regional Institute of Science and Technology, India</p> <p>Abstract: The increasing prevalence of unknown attacks, which target undiscovered weaknesses in software and hardware, poses substantial challenges to cybersecurity. Traditional detection methods such as signature-based techniques are ineffective against zero-day attacks because these attacks lack predefined signatures, allowing them to evade detection and inflict substantial damage. The current literature indicates that zero-day attacks often remain undetected for an average of 312 days, highlighting the urgent need for more effective detection methods. Anomaly-based detection offers a promising alternative by identifying deviations from normal behavior rather than relying on signatures thereby improving the detection of zero-day attacks. Machine learning (ML) enhances this approach by uncovering complex patterns in data and adapting to evolving attack strategies. The paper proposes an ensemble unsupervised ML based approach for zero-day attack detection evaluated on CIC-IoT2023 and NSL KDD datasets. CICIoT2023 dataset includes a wide range of benign and malicious traffic samples. By integrating One-Class SVM, Autoencoder, and Isolation Forest, the proposed approach accurately identifies anomalous traffic patterns linked to zero-day attacks. Evaluation results of the proposed approach reveal that accuracy and F1 scores are higher than the individual classifiers. The proposed approach delivered an accuracy of 96.09%, 96.43% F1 score on CICIoT2023 and 87.58% accuracy, 88.64% F1 score on NSL KDD datasets respectively.</p>
<p>CS2009-A</p> <p>16:40-16:55</p>	<p>Title: SmarTrax: IoT-Enabled e-Bike Rental System for Urban Mobility</p> <p>Authors: Art III Dela Cruz, Dazzle Estaciones, Gladys Quianzon, Arvin Lauron and Dr. Owen Pilongo</p> <p>Presenter: Art III Dela Cruz</p> <p>Abstract: This study focuses on the design and development of SmarTrax, a mobile application that manages and streamlines e-bike rental services. The app provides a user-friendly interface</p>

	<p>that requires users to register by inputting essential details such as email, full name, and password. It integrates an in-app currency system, requiring users to top up coins to rent items or extend rental time. A unique feature of the app mandates maintaining a minimum balance of 50 to 100 coins, enabling seamless rental extensions through a simple button press. SmarTrax ensures secure transactions, real-time updates on account balances, and an efficient user experience by validating registration details and monitoring rental durations.</p> <p>The system incorporates IoT technologies using Arduino and ESP32 to automate e-bike locking mechanisms and track rental durations, ensuring operational efficiency. Developed with React Native, the app is compatible with Android devices and includes real-time balance monitoring, GPS tracking, and rental history. Field tests, surveys, and beta testing demonstrated high user satisfaction across metrics such as performance expectancy, effort expectancy, and behavioral intention to use the system.</p> <p>The findings highlight SmarTrax as a reliable and effective tool for enhancing urban transportation services. Researchers recommend future enhancements, including maintenance alerts and expanded testing, to position the app as a sustainable mobility solution in Davao City.</p>
<p>CS1022</p> <p>16:55-17:10</p>	<p>Title: Technology Meets Vanity: How User Perception and Enjoyment in AR Virtual Makeup Application Drive Cosmetic Purchase Intentions</p> <p>Authors: Wei Ming Pang, Tze Wei Liew, Su-Mae Tan, Yi Yong Lee, Chin Lay Gan and Xin Yun Ng</p> <p>Presenter: Wei Ming Pang, Multimedia University Malaysia, Malaysia</p> <p>Abstract: Cosmetic makeup beautifies a person's features, while AR technology enriches user immersive experiences, with both overlaying artificial elements onto physical objects. At their intersection are AR virtual makeup applications, enabling users to try beauty products virtually, fostering enjoyment, and driving cosmetic product purchases. Despite the growing popularity of AR makeup applications among Malaysia's youth, limited research has explored the factors influencing enjoyment and purchase intention in this context. To address this gap, this study examines the impact of key AR attributes—perceived augmentation, aesthetics, socialization, privacy security, and media enjoyment—on user experience and purchase intention for cosmetic products. A quantitative research approach was adopted, involving undergraduate students from a large private Asian university who participated in an experiment using MakeupPlus, an AR makeup application, followed by a survey. Based on 189 valid participants, the findings reveal that augmentation, aesthetics, and socialization significantly influence purchase intention, while privacy security positively affects media enjoyment but not purchase intention. Interestingly, media enjoyment does not directly drive purchase intention. The study underscores the importance of augmentation, aesthetics, and socialization features in AR makeup applications for enhancing user engagement and driving purchase intention, offering practical insights for AR developers and cosmetic brands to optimize user enjoyment and boost product sales through AR technology.</p>

Onsite Session 2

Topic: Wireless communication and intelligent image analysis

Session Chair: Prof. Yingwah Teh, University of Malaya, Malaysia

Time: 14:00-17:25 (GMT+8, Beijing Time), Mar 1, Saturday

Venue: Hong Kong Chu Hai College, 6F - Room W613

<p>Invited Speaker</p> <p>14:00-14:25</p>	<p>Title: Modern Data Mining in Information Systems: A 2025 Perspective Invited Speaker: Prof. Yingwah Teh, University of Malaya, Malaysia</p> <p>Abstract: This talk examines the role of modern data mining techniques in advancing information systems, with a focus on enhancing property developer experiences. As data generation grows exponentially, data mining has become critical for optimizing systems, improving security, and enabling intelligent, real-time decision-making. Key techniques such as machine learning, clustering, and anomaly detection are applied to improve resource allocation and system efficiency in distributed and cloud-based environments. We also share our experience in developing data-driven solutions for the property development sector, addressing challenges like data privacy and scalability while exploring trends such as AI-driven analytics and edge computing.</p>
<p>Invited Speaker</p> <p>14:25-14:50</p>	<p>Title: An adaptive auto-tuning Healthcare system development in Hyperledger Besu Blockchain Invited Speaker: Jackey Cheung, The Chinese University of Hong Kong, Hong Kong, China</p> <p>Abstract: Blockchain (BC) is widely regarded as one of the most groundbreaking technologies in this decade, distinguished by its key attributes of decentralization, security, and accessibility. In this presentation, we aim to share our insights and experiences in examining the performance characteristics of Blockchain applications within Healthcare IoT (IoHT). Our focus will be on critical metrics such as transaction throughput, latency, and resource utilization. We will also discuss our approach to designing comparative experiments, considering parameters such as transaction send rate, block size, consensus mechanisms, and block time; and our investigation of the proof of authority consensus algorithms—namely QBFT, IBFT 2.0, and Clique, which was conducted using Hyperledger Caliper. We will analyze how these parameters influence the performance of a private Hyperledger Besu blockchain. Building on our findings, we have delved into the development of our proposed Hyperledger Besu auto-tuning system, which employs a tunnel-limiter to guide the system toward optimal operational conditions. This leads us to our adaptive BC-parameter-tunable Decentralized framework for IoHT (ABCD-IoHT), designed to enhance the throughput performance of medical healthcare systems while ensuring robust security under varying medical load conditions.</p>
<p>CS1031-A</p> <p>14:50-15:05</p>	<p>Title: A Robust Touchless Mouse System Using Hand Gesture Recognition Authors: Qiu Chen and Taito Kubota Presenter: Qiu Chen, Kogakuin University, Japan</p> <p>Abstract: As the demand for contactless technologies increases due to the spread of COVID-19, gesture recognition has attracted attention. In this study, we proposed and implemented a touchless mouse operation method using MediaPipe, a fast skeleton detection framework. We defined eight</p>

	types of gestures based on hand landmark coordinates and associated them with specific mouse events. Real-time hand gestures captured by a webcam are recognized and linked to corresponding device operations. Experimental results show that the recognition accuracy is improved compared with previous studies, proving the effectiveness of the proposed method. Furthermore, although usability tests show that the number of gestures makes the operation somewhat complicated, intuitive interaction with the system is generally achieved.
CS1048 15:05-15:20	<p>Title: Real time drowsiness detection by image processing from eye blinks</p> <p>Authors: Panwad Nakbuppa, Nattawut Boonton, Narathon Norasarn, Bamrung tausiesakul, Supun Tiptipakorn, Krissada asavaskulkiet</p> <p>Presenter: Krissada Asavaskulkiet, Faculty of Engineering, Mahidol University, Thailand</p> <p>Abstract: Transportation plays a crucial role in modern society, and many individuals rely on cars for commuting, which introduces potential risks to their safety. In Thailand, drowsy driving accidents rank as the third leading cause of traffic incidents. Our objective is to enhance road safety through a project that involves developing a Python-based camera system capable of detecting drowsiness, designed to be compatible with compact devices such as the Raspberry Pi. This camera will monitor eye blinks to identify signs of fatigue. This research's objective is to develop a system that can detect drowsy drivers and provide timely alerts to prevent accidents. We utilize MediaPipe and OpenCV to detect faces and incorporate data from research, such as PERCLOS to identify drowsiness. Our camera can accurately count eye blinks with 98\% accuracy for participants wearing glasses and 95\% accuracy for those without glasses on windows. On the Raspberry Pi 4 model B, the results are 97.33\% accuracy at 300 lx for participants without glasses, 95.27\% accuracy at 50 lx for participants without glasses, and 96.93\% accuracy at 0 lx for participants without glasses. Then, this research aims to develop a camera system capable of counting eye blinks, indicative of drowsiness, and triggering an alarm with a buzzer when a drowsy driver is detected.</p>
CS1042 15:20-15:35	<p>Title: Advanced Comparative Analysis of YOLOv8 and SSD MobileNet V2 for Real-Time Lethal Weapon Detection Using Fluoroscopic Imaging</p> <p>Authors: Genevieve A Pilongo, Kim Jude R Seballa, Mico Alejandro Avila, Leomer Allen V Yecyec</p> <p>Presenter: Genevieve A. Pilongo, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Abstract: In response to rising security threats, this study compares YOLOv8 and SSD MobileNet V2 models for real-time lethal weapon detection using fluoroscopic imaging. Using a dataset of approximately 14,000 images split 70:30 for training and testing, the study evaluates each model's efficiency and accuracy. YOLOv8 excelled in detecting smaller, concealed weapons due to its superior feature extraction, while SSD MobileNet V2 prioritized detection accuracy over breadth, offering a faster processing option. Findings indicate that YOLOv8 is generally more effective for weapon detection, though SSD MobileNet V2 may be preferable where speed is paramount. This research highlights model selection considerations crucial for enhancing security technology applications.</p>
15:35-15:55	Coffee Break (First Floor's Cafeteria)
CS2004	<p>Title: MoodLock: A Biometric & Token-based Authentication Service Integrating Facial & Emotion Recognition as Passkey for API Consumers</p>

15:55-16:10	<p>Authors: Lance Archie J. Endaya, Shennah Mae C. Dalogdog, Client Rowell R. Padriquela, Neil P. Magloyuan</p> <p>Presenter: Neil P. Magloyuan, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Abstract: The increasing challenges of traditional password management, such as memorization and vulnerability to theft, have led to growing interest in biometric authentication. Given this, biometric/biometric fusion authentication has been increasingly popular. To address the issues outlined, this study explored the development of a Biometric & token-based authentication service integrating facial & emotion recognition as passkey. InsightFace's ArcFace model for facial recognition demonstrated strong classification capabilities under various lighting and facial angles, though testing on masked faces resulted to significant performance degradation, suggesting further optimization is needed. The pre-trained FER model improved after fine-tuning with RAF-DB but further refinement is still needed as the model struggles to differentiate visually similar emotions, particularly, surprise and happiness. The system was tested in a real-world scenario at HighDef Supply and Services Corporation, where it demonstrated high resilience to environmental variations and successfully blocked all unauthorized attempts during a swap test. JWT testing further validated secure session management, ensuring the rejection of invalid or expired tokens. AES-256 and Blowfish encryption for data at rest, combined with TLS/SSL encryption for data in transit, safeguarded sensitive user information, including biometric data. Based on survey results, the system showcased strong security, usability, and performance, although improvements in resource efficiency and</p>
CS1040 16:10-16:25	<p>Title: Motor Imagery EEG Classification Based on Adaptive Weighted Multi-subject Sampling</p> <p>Authors: Huiyang Wang and Haixian Wang</p> <p>Presenter: Huiyang Wang, School of Biological Science & Medical Engineering Southeast University Nanjing, PR China</p> <p>Abstract: Single-subject motor imagery (MI)-based Electroencephalogram (EEG) data is often insufficient, leading to overfitting in deep learning models. Leveraging EEG data from other subjects to improve the classification accuracy for the target subject is a viable approach. However, due to significant distribution discrepancies across subjects' EEG data, increasing the training data can sometimes paradoxically decrease the classification accuracy for the target subject. Experimental results reveal that not all multi-subject samples yield positive benefits. This paper proposes an adaptive weighted multi-subject sampling (AWMS) method to utilize beneficial samples and minimize interference from detrimental ones. This method calculates the distances between the feature vectors of the multi-subject samples and those of the target subject. The weights of the multi-subject samples are then determined based on these distances: the larger the distance, the smaller the weight, and vice versa. The subject-specific MI-based EEG classification performance demonstrates the advantages of the AWMS method. For example, using EEGNet as the backbone, AWMS achieved an 83.22% state-of-the-art classification accuracy on the BCI Competition IV 2a (BCICIV-2a) dataset.</p>
CS2006 16:25-16:40	<p>Title: Rangers of the Blue: Assessing the Educational Potential of Augmented Reality (AR) Games in Marine Preservation</p> <p>Authors: Joshua Emmanuel O. Cifra, Guillan Fredd T. Parreño, Janmark Laurence D. Perucho, and Neil P. Magloyuan</p>

	<p>Presenter: Mr. Guillan Fredd T. Parreño, College of Computer & Information Science, Philippines</p> <p>Abstract: This study investigated the burgeoning intersection of video game technology and marine conservation education. The research focused on understanding how AR games can be leveraged as educational tools to enhance awareness and drive action toward marine preservation. Given the increasing loss of marine biodiversity due to human activities, this study aimed to bridge the gap between knowledge and action by employing AR games to foster global awareness and promote ecological responsibility. The study used a pre-test and post-test design to analyze the impact of AR games on participants' knowledge, attitudes, and behaviors related to marine conservation. Participants played a series of AR games designed for this study, focusing on different aspects of marine preservation. The researchers conducted assessments before and after the games to measure changes in awareness and attitudes toward marine biodiversity conservation. The findings revealed significant positive shifts in participants' awareness and understanding of marine preservation issues post-engagement with the AR games. There was a notable increase in participants' willingness to participate in marine conservation efforts, suggesting that AR games can effectively complement traditional educational methods by providing immersive and interactive learning experiences. These trends indicate the potential of video games, particularly AR games, as powerful tools in environmental education and advocacy, capable of mobilizing younger generations towards sustainable actions for marine preservation.</p>
<p>CS1027</p> <p>16:40-16:55</p>	<p>Title: Non-Contact Extraction of Seismocardiogram From FMCW Radar Signals Using a Variational Modal Decomposition Algorithm</p> <p>Authors: Guang Yu, Chengyu Liu, Chenxi Yang and Jianqing Li</p> <p>Presenter: Guang Yu, Southeast University, China</p> <p>Abstract: The Seismocardiogram (SCG) is a mechanical signal caused by the vibrations of the chest surface due to heartbeats. SCG is closely related to cardiac activities, including myocardial contraction and relaxation, as well as the opening and closing of heart valves. Therefore, SCG provides a new method for monitoring cardiac function in addition to the Electrocardiogram (ECG). This paper proposes a method for measuring SCG signals using a 77 GHz frequency-modulated continuous wave (FMCW) radar, which can non-invasively measure SCG signals with a high signal-to-noise ratio (SNR) and capture seven prominent feature points. The method begins by extracting raw vital signs from the radar signal, followed by median filtering to remove pulse noise. Then, a Variational Mode Decomposition (VMD) algorithm is applied to decompose the raw vital signs into 20 modes. After analysis, modes 11 to 15 are selected and reconstructed to obtain the SCG signal. We collected synchronized radar and ECG data from five subjects and validated the proposed method. The results show that the method can extract SCG signals with a higher signal-to-noise ratio, with the SCG signal clearly exhibiting seven characteristic points of cardiac activity. Notably, the aortic opening (AO) point corresponds to the R-wave peak of the ECG, and the Interbeat Interval (IBI) derived from the SCG signal is nearly identical to that calculated from the ECG signal.</p>
<p>CS1002</p> <p>16:55-17:10</p>	<p>Title: Key generation parameter set selection strategy in 5G NR wireless networks Authors: Cai Song and Yang Xuan</p> <p>Presenter: Huiyang Wang, School of Biological Science & Medical Engineering Southeast University Nanjing, PR China</p>

	<p>Abstract: The rapid advancement of 5G NR technology and its widespread deployment in diverse applications have introduced new challenges to network security. The innovative architecture of 5G NR not only supports flexible customization of subcarrier spacing and frame structures but also empowers devices to select optimal configurations based on factors like mobility, service characteristics, and coverage needs. However, current research has largely overlooked the potential of fine-tuning system parameters to improve both key generation efficiency and overall system security. To address this gap, this paper analyzes the time-frequency domain correlation and key generation rate as key metrics. We explore the flexibility of parameter selection in 5G NR systems and its impact on the key generation process. By calculating the Pearson correlation coefficient of channel estimates in the time-frequency domain, we propose a parameter selection strategy for enhancing 5G NR physical layer security, which we validate through simulations. The results show that in fast-fading wireless environments, smaller subcarrier spacing provides better results, while in frequency-selective fading channels, larger subcarrier spacing significantly improves wireless key generation performance.</p>
<p>CS1001</p> <p>17:10-17:25</p>	<p>Title: Comparison of the Throughput Achieved by Resource Schedulers in a Congested mmWave IAB Network</p> <p>Author: Osama AlQahtani</p> <p>Presenter: Osama AlQahtani, Jazan University, Saudi Arabia</p> <p>Abstract: As mobile telephony users require increased throughput new solutions are required at different network layers to fulfill such requirements. Millimeter wave (mmWave) is one solution proposed for the physical layer, mainly taking advantage of spectrum availability, however this technology comes with limitations such as increased path loss and susceptibility to signal blockage due to obstacles. Increasing base stations density is one proposed solution for these limitations, nevertheless, providing optical fiber backhaul to all stations would be expensive and complex. Therefore, Integrated Access and Backhaul (IAB) has been proposed to share base station resources for backhauling as well. In this work, we study two base station resources schedulers, the round robin and the proportional fair schedulers, in an IAB mmWave scenario where users require higher data rates than what is available, characterizing a network congestion situation. The results are compared to the ones achieved in a non-congested scenario.</p>

Online Session 1

Topic: Data-oriented information system design and security certification

Session Chair: Prof. Hong Lin, University of Houston-Downtown, USA

Time: 9:30-11:45 (GMT+8, Beijing Time), Mar 2, Saturday

Zoom ID: 864 4278 4183 **Password:** 202502

Zoom Link: <https://us02web.zoom.us/j/86442784183>

<p>Invited Speaker</p> <p>9:30-9:55</p>	<p>Title: Sleep stage analysis by Bayesian Network</p> <p>Invited Speaker: Prof. Hong Lin, University of Houston-Downtown, USA</p> <p>Abstract: Our research team built a self-learning Bayesian network adept at elucidating intricate relationship mappings within raw single-channel electroencephalography (EEG) data. The algorithm employed probabilistic graphical models to decode both the dynamic and static interdependencies inherent in EEG signals, providing an unprecedented framework for an in-depth understanding of sleep dynamics.</p> <p>By proper signal discretization and construction of a Bayesian network, the system can autonomously identify and intricately model both time-invariant features and their dynamic relationships across various sleep stages. The innovative methodology we employed focused upon uncovering relationships present in the data by pivoting around the construction of a Bayesian network which autonomously learns probabilistic relationships from EEG data. Our approach diverges radically from traditional methods by seamlessly integrating automated feature extraction and intricate temporal sequence analysis within a single, unified modeling framework.</p>
<p>Invited Speaker</p> <p>9:55-10:20</p>	<p>Title: Theoretical Information Science</p> <p>Invited Speaker: Prof. Paulo Batista, University of Évora, Portugal</p> <p>Abstract: Following the Second World War an explosion in the quantity of documentation led to a dramatic change in Archiving, or the profession referred to as records managers/records management and archivists/archives. Starting in the 1980s, however, archivists in Quebec began to make great progress by changing their approach and looking at the entire documentary cycle from current to definitive information. Carol Couture and Jean- Yves Rousseau made a crucial contribution towards the understanding of the Three Age Theory that viewed Archiving as an integrated discipline centered on a structural understanding of archives. In 1994, their work Les Fondements de la Discipline Archivistique, presented a new interpretation of Theodore Schellenberg's Three Age Theory. They called attention to the fact that the three phases of archival documents are not separate but, on the contrary, integrated. They argued that these three stages can even be looked at in a segmented way, provided the union between them is ensured. Their great innovation relative to Schellenberg's work lay, precisely, in critiquing the division and separation between the three ages of archival documents. Couture and Rousseau thereby brought together all the phases of the lifecycle of records, from production to dissemination, in opposition to the sterile distinction advocated by traditional archivists and document managers. In my opinion, however, the best approach to integrating information management is known as records continuum, which places archives in a post-custodial, informational, and scientific paradigm. This</p>

	<p>Australian concept arose in the 1990s amid the huge explosion of information, communication technologies and new media. This context forced Information Science to redefine its object of study. Records continuum is closely related to the integrated management model of Couture and Rousseau, while it carries their innovation further, perfecting it and replacing it with systemic dynamics and providing continuity between archives. In fact, records continuum means, literally, continuous management. It looks at the whole process from the production of records to their final archiving. Otherwise, we cannot speak of continuous management. That is why, when we speak of rigid archives – current, intermediate, and definitive, this approach is more theoretical than practical. There is, in fact, no separation between these phases, even less so from the point of view of the value of documents. The traditional distinction between information with probative and historical value ceases to exist. The information is simultaneous and is, in fact, the same.</p>
<p>Invited Speaker</p> <p>10:20-10:45</p>	<p>Title: Learned Indices for Spatial Data Invited Speaker: Prof. Chuan-Ming Liu, National Taipei University of Technology, Taiwan</p> <p>Abstract: An index is a structure or organization on data for effectively managing data item in terms of time and space, such as hash tables, binary search trees, and B-trees. As the properties and types of data change over time, new appropriate indices for efficient management on data become more and more important and necessary. On the other hand, as the techniques of machine learning or deep learning advance, many applications using machine learning for a better performance have been explored. Recall the idea and objective of an index. The index now can be seen as a model in machine learning, which can locate the data item effectively by prediction. With this observation, a learned index, a model that considers the patterns and distributions of data, has been proposed to facilitate search processing. Some learned indices have been provided for one-dimensional data, including Range Index and Recursive Model Index (RMI). For multi-dimensional (or spatial) data, it is always a challenging work to have effective index structures. Some well-known spatial indices, like kd-trees, quad-trees, and R-trees, with their variants for improvement on the efficiency have been studied till now. It thus is interesting and worthy to study the learned indices on spatial (multi-dimensional) data for a better performance. In this talk, the learned indices will be introduced starting with the ones for one-dimensional data. We then focus on the learned indices for spatial data and present our learned indices based on index tree structures. With the learned indices as models, evaluation on preprocessing, training, prediction, error, as well as query processing for point, range and kNN queries will be addressed as well.</p>
<p>CS1049</p> <p>10:45-11:00</p>	<p>Title: Aquaculture Automation using Retrieval-Augmented Generation with Large Language Model and AIoT Systems Authors: Pobporn Danvirutai & Siriporn Tola & Bundit Yuangsoi & Siripavee Charoenwattanasak & Kampon Thaiso & Chavis Srichan Presenter: Asst. Prof. Dr. Chavis Srichan, Khon Kaen University, Thailand</p> <p>Abstract: Aquaculture industry contributes significantly to global food production and sustainability. The integration of Retrieval-Augmented Generation (RAG) – Large Language Model (LLM) systems with Internet of Things (IoT) devices presents a transformative opportunity for the automation of aquaculture. This manuscript explores the potential of IoT/RAG-LLM integration to enhance the scalability, efficiency, and sustainability of aquaculture operations. We compare two methods: automation using Expert RAG-LLM, where experts' Q&A are stored in a vector database, and traditional human expert management. Our findings indicate that while Expert RAG-LLM automation achieves 2% lower growth rates compared to human experts, it offers significant advantages in terms of calability and</p>

	<p>operational efficiency. Furthermore, this study highlights how the synergy between RAG-LLM models and real-time IoT data can facilitate intelligent automation in aquaculture, potentially serving as a framework for other sectors of food production as well. By integrating expert-curated information, these systems are poised to offer reliable, data-driven solutions that can adapt and respond to rapidly changing aquatic environments. The findings presented here lay the groundwork for future explorations and improvements, urging researchers and practitioners to embrace AI-based automation as a pivotal tool in securing global seafood supplies.</p>
<p>CS1014</p> <p>11:00-11:15</p>	<p>Title: SQL Injection Attacks Targeting E-Commerce Web Applications: Causes, Consequences, and Prevention Strategies</p> <p>Authors: Eric Blancaflor & Reanne Angela Buccat & Shayne Victor Bauzon & Marcus Ram Garcia & Miguel Antonio Villaruel, Alberto Villaluz</p> <p>Presenter: Eric Blancaflor, Mapua, Philippines</p> <p>Abstract: SQL Injections are a type of web application attack, although common, this type of attack was identified to be one of the biggest threats in the digital world and still has continuous growth that makes it hard to stop. SQL Injections attacks are used to access and modify the SQL database of the web application to access the E-commerce database. Attackers may use SQL Injections to steal valuable information such as user credentials, key passwords, bank card numbers, and other personal data of a user that are stored within the database of the site. This type of attack could also be used to disrupt the working environment of a business by causing massive destruction in their database system by deleting and modifying valuable information. As we know, E-commerce web applications are one, if not the most, the most prominent and widely used applications as of today. Transactions are being made online everyday. because of the trend of live selling and online shopping. Because of this, they are most likely the most valuable target that exists right now. This study aims to provide information on how and why these attacks are being conducted. We would also like to cite some of the probable consequences if these attacks are left alone. And cite strategies and techniques on how one can better prevent and mitigate these types of attacks to improve their database security.</p>
<p>CS1024</p> <p>11:15-11:30</p>	<p>Title: Energy Efficient Parallel Computational Offloading through Boosting-Based Machine Learning Techniques</p> <p>Authors: Haris Khan, Zaiwar Ali, Ziaul Haq Abbas, Ghulam Abbas and Zara Shahid</p> <p>Presenter: Haris Khan, GIK Institute, Pakistan</p> <p>Abstract: The rising demand for real-time applications on mobile devices is straining their processing capabilities and battery life. Mobile Edge Computing (MEC) offers a solution by enabling these devices to offload tasks to nearby servers with greater computational power. However, optimizing task offloading is challenging in scenarios involving multiple servers and tasks due to variable network conditions and limited server resources. The key challenge is balancing reduced data transfer with low communication delays. To address this challenge, we propose an Energy-efficient Boosting-based Machine Learning Parallel Offloading Scheme (EBPOS). This approach minimizes the overall cost for mobile devices (MDs) by introducing a cost function that accounts for energy consumption, service delays, radio resources, energy consumption and delay due to task partitioning, and computing resources of the MDs and servers.</p>

	<p>Given the computational complexity of this cost function, we generate a training dataset to train an XGBoost model, enabling a faster and more efficient decision-making process. The proposed work finds the optimal number of components, task partitioning, and offloading decision policy simultaneously. Simulation results show that EMPOS significantly reduces both latency and energy consumption, achieving a high accuracy of an XGBoost model of up to 76%.</p>
<p>CS1018</p> <p>11:30-11:45</p>	<p>Title: WAISMAIS: IoT-Enhanced Corn Disease Diagnosis Using Decision Tree Classifier for Soil NPK Analysis and YOLOv8 for Disease Identification</p> <p>Authors: Martzel P. Baste, Patricia Anne Marie D. Go, Julia Coleene B. Panggoy, Nexxus Jude V. Sealana</p> <p>Presenter: Martzel Pelicano Baste, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Abstract: Corn, a global staple crop, plays a crucial role in ensuring food security, particularly in the Philippines, where it serves as a vital component of the nation's food system. However, its production faces significant challenges, especially in remote areas where farming practices such as manual disease identification are still prevalent. This study addresses the problem by developing a multi-platform mobile application that integrates IoT devices and machine learning models (MLM) for enhanced corn disease diagnosis and soil nutrient analysis. Utilizing Decision Tree classifiers for soil NPK data and YOLOv8 for corn disease detection, the system aims to provide farmers with real-time, accurate, and actionable insights. The methodology involved integrating IoT devices, training MLM, and creating a mobile application using the Flutter framework. The Decision Tree models for soil analysis showed satisfactory precision, recall, and F1 scores, while the YOLOv8 model achieved high accuracy in corn disease identification. The application was evaluated using ISO/IEC 25010 User Acceptance Test Criteria, showing high scores key criterias. This study demonstrates the potential of integrating modern technology into agriculture to improve corn production and disease management. Future researchers could explore other MLM, store the MLM offline, use native programming languages, incorporate weather data, use a user-centered approach, and implement additional language into the application.</p>

Online Session 2

Topic: Data center network, network security and signal transmission

Session Chair: Prof. Ghulam Abbas, GIK Institute of Engineering Sciences and Technology, Pakistan

Time: 13:00-15:30 (GMT+8, Beijing Time), Mar 2, Sunday

Zoom ID: 864 4278 4183 **Password:** 202502

Zoom Link: <https://us02web.zoom.us/j/86442784183>

<p>Invited Speaker</p> <p>13:00-13:25</p>	<p>Title: Instruction-Level Parallelism in High-Performance and Networked Systems</p> <p>Invited Speaker: Prof. Ghulam Abbas, GIK Institute of Engineering Sciences and Technology, Pakistan</p> <p>Abstract: As computational demands grow, optimizing processor efficiency is essential for high-performance and networked computing environments. Instruction-Level Parallelism (ILP) plays a key role in improving execution speed by enabling multiple instructions to be processed concurrently. This talk explores ILP fundamentals, covering pipelining, multiple issue, and out-of-order execution techniques to enhance processor throughput.</p> <p>We will discuss the impact of ILP on modern computing, particularly in data centres, HPC clusters, and AI-driven systems, where efficient instruction processing is critical. Additionally, we will examine pipeline hazards and strategies to mitigate them. The session will also highlight advanced ILP techniques and recent trends, which power modern high-speed processors.</p> <p>By the end of this talk, attendees will gain a deeper understanding of how ILP optimizations contribute to computational efficiency in networked and high-performance systems, making it a crucial concept for both academia and industry.</p>
<p>Invited Speaker</p> <p>13:25-13:50</p>	<p>Title: Task Offloading Optimization Algorithm for Time-Energy Minimization in Mobile Edge Computing</p> <p>Invited Speaker: Assoc. Prof. Rohaya Binti Latip, Universiti Putra Malaysia, Malaysia</p> <p>Abstract: Mobile edge computing (MEC) is a promising technology that enhances computational capacity and reduce the latency at the edge of mobile networks, yet task offloading in edge computing remains challenging due to its dynamic configurations and the significant resource requirements involved. Existing literature has made strides in addressing these issues; however, many solutions fail to adequately consider the optimal selection of tasks and their inherent dependencies, which are crucial for efficient offloading. Therefore, this paper proposed a weighted quantum particle swarm and dispatched task offloading problem in mobile edge computing as a multi-objective function aimed at minimizing both energy consumption and task completion time. We introduce a novel weighted quantum particle swarm optimization with Dispatched (WQPSOD) task offloading optimization algorithm designed to enhance performance in mobile edge computing environments. The WQPSOD algorithm is implemented in Python and evaluated in a multi-user, multi-server context. Our experimental results demonstrate that WQPSOD significantly outperforms benchmark algorithms, by achieving 60.88% and 51.10% improvement in task completion time and system energy consumption respectively.</p>

<p>Invited Speaker</p> <p>13:50-14:15</p>	<p>Title: Predicting Cybersecurity Behaviour among Professionals in Malaysia Invited Speaker: Assoc. Prof. Teoh Ai Ping, Universiti Sains Malaysia, Malaysia</p> <p>Abstract: This paper explores the factors influencing cybersecurity behavior among accounting professionals in Malaysia by integrating Protection Motivation Theory (PMT) and Technology Threat Avoidance Theory (TTAT). Using a survey-based approach, data were gathered from 285 professionals through an online questionnaire, with 260 valid responses analyzed using SmartPLS. The findings reveal that perceived severity and rewards significantly impact perceived threat, whereas perceived vulnerability does not show a direct effect. Protection motivation is directly influenced by perceived threat and self-efficacy, while response cost does not have a significant impact. Moreover, protection motivation serves as a key mediator between perceived threat and self-efficacy in shaping cybersecurity behavior but does not mediate response cost. Cybersecurity awareness moderates the impact of response cost but not perceived threat or self-efficacy, whereas safeguard effectiveness negatively moderates the relationship between protection motivation and cybersecurity behavior. This study enriches the existing literature by examining the interplay between perceived threat, response cost, self-efficacy, protection motivation, and cybersecurity behavior, offering valuable insights for researchers, practitioners, and policymakers to enhance cybersecurity practices in professional settings.</p>
<p>CS1046</p> <p>14:15-14:30</p>	<p>Title: A Low-Complexity 2D-MUSIC Algorithm with Coarse and Fine Quadratic Interpolation for 5G mmWave Localization Authors: Jin-Man Shen, Hua-Min Chen, Hui Li and Peng Wang Presenter: Jinman Shen, School of Information Science and Technology, Beijing University of Technology, China</p> <p>Abstract: This paper proposes a low-complexity two dimensional multiple signal classification (2D-MUSIC) algorithm for angle of arrival (AoA) estimation in 5G millimeter-wave (mmWave) systems. The proposed algorithm combines coarsegrained peak search with quadratic interpolation to achieve high-precision angle estimation while significantly reducing computational complexity. By leveraging the large bandwidth and narrow beams of 5G mmWave systems, the proposed method enhances angular resolution and improves positioning accuracy, particularly in scenarios with limited computational resources. Simulation results demonstrate that the algorithm achieves an angular resolution of up to 0.1° in both azimuth and elevation discriptions across various resource configurations. Compared to traditional fine-grained peak search method, the proposed approach reduces computational costs and provides reliable support for high-precision localization in mmWave communication systems.</p>
<p>CS1045</p> <p>14:30-14:45</p>	<p>Title: An Uplink Amplification Scheme for Enhanced Spotlight Antenna Performance in High-Rise Communities Authors: Guo Wang, Shangkun Xiong, Weili Wang, Hong Wu, Chao Yu, Zhe Dong, Pu Song and Dongliang Zhang Presenter: Guo Wang, Chinatelecom, China</p> <p>Abstract: In residential communities, radio frequency distribution systems are commonly utilized to disseminate signals from the Radio Remote Unit (RRU) to multiple spotlight antennas, facilitating inter-building signal coverage. However, the system, comprising feeder lines and power splitters, always results in signal losses exceeding 10 dB between RRU and spotlight</p>

	<p>antennas, which increases the system's Noise Figure (NF) and exacerbates limitations in uplink communication performance. To mitigate the issue of poor uplink performance degradation caused by passive gain, this paper innovatively proposes an uplink amplification scheme into spotlight antennas. We present the design of the scheme and analyze its technical principles, along with experiment results in actual scenarios, while comparing it with traditional normal spotlight antenna solutions. The results indicate that the uplink amplified spotlight antenna solution significantly enhances uplink performance of users. Compared to spotlight antennas, the edge user rate of uplink is enhanced by 3 to 10 times, demonstrating its broad application prospects and promotional value.</p>
<p>CS1051</p> <p>14:45-15:00</p>	<p>Title: Ultra-Fast Digital Telecommunications with Near-Faster-Than-Light Entangled Qubit Dynamic System</p> <p>Authors: Chavis Srichan, Pobporn Danvirutai, and Nawapak Eua-Anant</p> <p>Presenter: Asst. Prof. Dr. Chavis Srichan, Khon Kaen University, Thailand</p> <p>Abstract: Quantum entanglement presents groundbreaking possibilities for near-faster-than-light telecommunications. In this work, we investigate continuous qubit rotation in entangled systems, examining its impact on wavefunction evolution and the associated magnetic field interactions among entangled qubits. Building on both theoretical principles and practical considerations, we propose a dynamically controlled qubit framework aimed at enabling exceptionally high-speed classical data transmission.</p>
<p>CS1029</p> <p>15:00-15:15</p>	<p>Title: Enhanced SC Decoding with Half-Differential-Half-Coherent Demodulation for BDPSK Modulated Polar Codes</p> <p>Authors: Yunxiao Li, Ruochen Jia, and Daiming Qu</p> <p>Presenter: Ruochen Jia, Huazhong University of Science and Technology, China</p> <p>Abstract: In this paper, we propose an enhanced successive cancellation decoding with Half-Differential-Half-Coherent demodulation (ESC-HDHC) for binary differential phase shift keying (BDPSK) modulated polar codes. We first decode the first half of the source bits using differential demodulation and successive cancellation (SC) decoding. Next, we recover the even-indexed BDPSK symbols based on the first half of the source bits and use these symbols for channel estimation. Based on the estimated channel, coherent demodulation and SC decoding are performed to decode the second half of the source bits. Coherent demodulation enhances the reliability of the second half of the source bits, thus improving the overall decoding performance.</p>
<p>CS1030</p> <p>15:15-15:30</p>	<p>Title: Non-Binary Polar Codes for Pulse Position Modulation</p> <p>Authors: Ruochen Jia, Yunxiao Li and Daiming Qu</p> <p>Presenter: Ruochen Jia, Huazhong University of science and technology, China</p> <p>Abstract: Pulse Position Modulation (PPM) is widely used in optical wireless communication systems because of its higher power efficiency and minimal inter-symbol interference effects. And error correction codes are often applied in PPM modulation systems to enhance the system's anti-noise performance. This paper proposes a non-binary polar code scheme suitable for PPM, and constructs the non-binary polar codes with Monte Carlo construction method. Simulation results indicate that the anti-noise performance of the PPM modulation system using non-binary polar codes is significantly better than that of the uncoded system.</p>

Online Session 3

Topic: Image-based detection model and intelligent computing

Session Chair: Ascco Prof. Rhodessa Cascaro, Mapua Malayan Colleges Mindanao, Philippines

Time: 15:45-17:35 (GMT+8, BeijingTime), Mar 2, Sunday

Zoom ID: 864 4278 4183 **Password:** 202502

Zoom Link: <https://us02web.zoom.us/j/86442784183>

<p>Invited Speaker</p> <p>15:45-16:10</p>	<p>Title: Automated Confidence Based Learning and Assessment</p> <p>Invited Speaker: Prof. Jyotsna Kumar Mandal, University of Kalyani, India</p> <p>Abstract: In this lecture the requirements for development of a system that will promote CBL with an architecture of the same. Existing methods, techniques, and models available in the field of e-learning or TEL are studied and presented and the research gap has been formulated. Moreover. The talk stressed upon the requirement of an enhanced learning content development framework and augmented assessment methodology. In proceeding through the lecture it became evident that as the CBL is concerned with the world of work, input from the jobsite is of immense importance in establishing the performances and adequacies of the learners. Learning Record Store (LRS) are used to identify the adequacies and in promoting the customized content development. The customization of the content and prescribing it to the learner is also important and a method to be discussed in this area. There is a requirement of monitoring the performance of learning method will be discussed.</p>
<p>Invited Speaker</p> <p>16:10-16:35</p>	<p>Title: Speech Title: Enhancing Solar GHI Forecasting with Dual-Input Features and Lightweight Transformer Models</p> <p>Invited Speaker: Dr. Chiagoziem Chima Ukwuoma, Chengdu University of Technology, China</p> <p>Abstract: Accurate Global Horizontal Irradiance (GHI) forecasting is essential for efficient solar energy management. Traditional statistical models such as ARIMA and numerical weather prediction (NWP) models, though interpretable, struggle with capturing the nonlinear dependencies and rapid weather variations affecting solar radiation. Deep learning models, including Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, have improved forecasting by leveraging spatial and temporal patterns. However, CNNs lack temporal awareness, while LSTMs suffer from high training costs and vanishing gradient issues. Transformer models have recently emerged as a powerful alternative, effectively capturing long-range dependencies through self-attention mechanisms. However, their high computational complexity limits their practicality in real-time applications. Another major challenge in GHI forecasting is data modality. Numerical weather data, such as temperature, humidity, and wind speed, provide useful meteorological insights but lack spatial granularity. Conversely, image-based models utilizing sky or satellite images offer spatial awareness but demand extensive storage and computational resources. Relying solely on either numerical or image-based inputs restricts forecasting accuracy and robustness.</p> <p>We propose the design and application of dual-input lightweight transformer models that can integrate numerical weather data with sky image features to enhance forecasting accuracy while minimizing computational overhead. A CNN encoder extracts spatial features from sky images, while numerical weather features are processed through a dedicated transformer branch. The</p>

	<p>model employs a self-attention mechanism to effectively combine both data sources, capturing intricate spatial-temporal dependencies. Experimental results demonstrate that the proposed approach outperforms statistical models, standalone CNNs, and conventional transformer models in short- and medium-term GHI forecasting. The fusion of numerical and image-based data significantly improves predictive accuracy, while the lightweight transformer architecture ensures computational efficiency, making it viable for real-time deployment in solar energy management systems. This study underscores the importance of hybrid deep learning architectures in advancing solar forecasting, contributing to a more stable and efficient renewable energy grid.</p>
<p>CS1025</p> <p>16:35-16:50</p>	<p>Title: DERMATEL: An Integrated Web-Based Telemedicine System with Image Processing for Personalized Eczema Classification and Management</p> <p>Authors: Mary Jane C. Samonte, James Jireh R. Abrenica, Stephanie Trish B. Fabico, Gillian Isabelle F. Uy</p> <p>Presenter: James Jireh R. Abrenica, Mapua University, Philippines</p> <p>Abstract: DERMATEL is an integrated web-based telemedicine system designed to enhance the management and classification of various eczema types, including Asteatotic Eczema, Chronic Eczema, Hand Eczema, Nummular Eczema, and Subacute Eczema. This system addresses the growing need for efficient dermatological care by leveraging advanced technologies to facilitate remote consultations, improve patient outcomes, and streamline healthcare delivery. The development of DERMATEL involved a comprehensive requirements analysis phase that engaged stakeholders, including patients, dermatologists, and administrators, to ensure the system effectively met user needs. This paper discusses the design, implementation, and evaluation of the DERMATEL system, highlighting its contributions to telemedicine and eczema management. Preliminary user feedback indicates that DERMATEL significantly improves accessibility to dermatological care, supports effective patient-dermatologist communication, and provides a valuable tool for the classification and management of eczema, paving the way for future innovations in telehealth.</p>
<p>CS2007</p> <p>16:50-17:05</p>	<p>Title: Adversarial Attack Against Images Classification based on Generative Adversarial Networks</p> <p>Authors: Yahe Yang and Cailian-Ruan</p> <p>Presenter: Yahe Yang, George Washington University DC, USA</p> <p>Abstract: Adversarial attacks on image classification systems have always been an important problem in the field of machine learning, and generative adversarial networks (GANs), as popular models in the field of image generation, have been widely used in various novel scenarios due to their powerful generative capabilities. However, with the popularity of generative adversarial networks, the misuse of fake image technology has raised a series of security problems, such as malicious tampering with other people's photos and videos, and invasion of personal privacy. Inspired by the generative adversarial networks, this work proposes a novel adversarial attack method, aiming to gain insight into the weaknesses of the image classification system and improve its anti-attack ability. Specifically, the generative adversarial networks are used to generate adversarial samples with small perturbations but enough to affect the decision-making of the classifier, and the adversarial samples are generated through the adversarial learning of the training generator and the classifier. From extensive experiment analysis, we evaluate the effectiveness of the method on a classical image classification dataset, and the results show that our model</p>

	successfully deceives a variety of advanced classifiers while maintaining the naturalness of adversarial samples.
CS1028 17:05-17:20	<p>Title: ECD-DSA: Estimating Crowd Density to Detect Sparse Areas to Aid in Crowd Management Using YOLOv8</p> <p>Authors: Janelle Cassandra C. Uy, John Francis L. Puebla, Ian Miguel D. Lancian, Rhodessa J. Cascaro</p> <p>Presenter: Rhodessa J. Cascaro, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Abstract: This study aims to develop a model and application to estimate crowd density and detect sparse areas, addressing the need for crowd monitoring due to the global pandemic and incidents like stampedes and crowd surges. The YOLOv8 algorithm was used to train a model for human detection in crowds. Two applications were created: one for CCTV Operators and another for Officers In-charge. The CCTV Operator's app monitors the crowd through cameras and generates warnings for rising crowd densities and overcrowding. The Officers In-charge app receives these warnings for quicker information dissemination. A density threshold, validated by crowd science experts, was used to determine crowd density levels and timing for generating warnings. The model detects people in the video stream, calculates crowd density, and generates a heatmap to identify dense and sparse areas. The model achieved a precision of 81.65%, recall of 42.29%, and an F1 Score of 55.72%. The application proved useful for crowd density estimation and sparse area identification, with overall user satisfaction rated at M=4.68, and SD=0.44. The study successfully met all its objectives.</p>
CS1034 17:20-17:35	<p>Title: SHOETHENTICATOR: A CNN-Based Approach Using YOLO v8 to Differentiate Original and Counterfeit Sneakers</p> <p>Authors: Martzel P. Baste, Fernando Z. Maldonado, Jakob Hans P. Maraguinot, and Raymund M. Fandiño</p> <p>Presenter: Martzel Pelicano Baste, Mapua Malayan Colleges Mindanao, Philippines</p> <p>Abstract: This study examined the creation and assessment of Shoethenticator, a smartphone app that uses the YOLOv8 Convolutional Neural Network (CNN) model to authenticate sneakers. The primary goal was to properly train the YOLOv8 model to identify essential shoe characteristics and distinguish genuine sneakers from counterfeit ones. The app's performance was assessed across various scenarios, including different lighting conditions, backdrops, angles, and zoom levels. Under optimal settings, the app performed exceptionally well, recognizing and authenticating footwear with ease, including in bright illumination, vivid backdrops, and high magnification levels. However, difficulties were noted with low light conditions, dark backgrounds, and grayscale photos, emphasizing areas for further improvement. To evaluate functionality, usability, security, and other important metrics, user feedback was also incorporated in the assessment.</p>

Hong Kong Attractions

Victoria Harbour



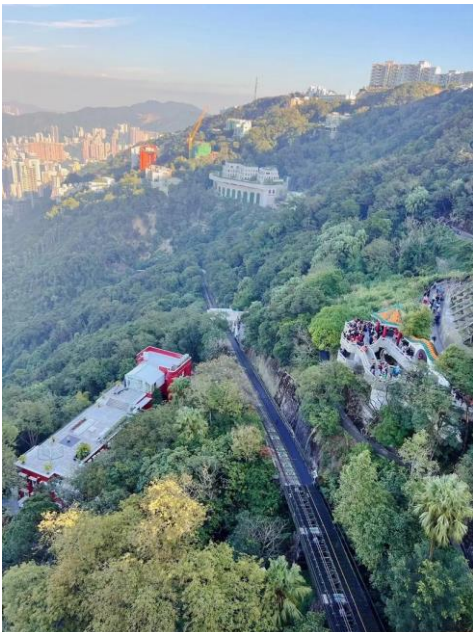
Victoria Harbour, located in Hong Kong, China, is a world - renowned natural deep - water harbor. It is surrounded by the towering skyscrapers of Hong Kong Island and Kowloon Peninsula, creating a breathtaking skyline.

The harbour is not only a vital transportation hub but also a major tourist attraction. Every day, numerous ferries, cruise ships, and cargo vessels shuttle through the water, demonstrating its importance in regional trade and transportation.

At night, the harbour comes alive with a spectacular light show. The Symphony of Lights, one of the world's largest permanent light and sound shows, illuminates the skyline, with buildings on both sides of the harbour showcasing a dazzling display of lights, music, and laser effects.

Victoria Harbour is a symbol of Hong Kong's prosperity and dynamism. It attracts millions of tourists every year, who come to enjoy the magnificent views, take a ferry ride, or simply soak in the vibrant atmosphere. Whether you are a local or a visitor, a trip to Victoria Harbour is an essential part of experiencing the charm of Hong Kong.

The Peak



The Peak, located on Hong Kong Island, is the highest point in Hong Kong. Standing at the summit, you are greeted with a panorama that is nothing short of spectacular.

The view from The Peak offers a bird's - eye perspective of the entire city, including the magnificent Victoria Harbour, the densely packed skyscrapers of Central, and the lush greenery of the surrounding areas. It serves as a perfect vantage point to witness the harmonious blend of modern metropolis and natural beauty.

There are various attractions on The Peak. The Peak Tower, with its unique architecture, is a popular landmark where tourists can enjoy dining, shopping, and the Sky Terrace 428 for an even more immersive view experience. Additionally, the Peak Tram, a funicular railway with a long - standing history, provides an exciting way to ascend and descend

the mountain, adding an extra touch of adventure to the visit.

Year - round, The Peak attracts countless tourists. Whether during the day when the city is bustling with activity or at night when the city is lit up by a sea of lights, a trip to The Peak is an unforgettable experience, allowing you to truly feel the charm and energy of Hong Kong.

Note

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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