The 15th International Conference on Electronics, Communications and Networks (CECNet 2025)

November 24-26, 2025 Hong Kong

- Keynote Speakers -

Kin K. Leung

Professor, EEE and Computing Department, Imperial College, UK

Speech Title: Machine Learning for Communication Networks

Abstract: Allocation of limited resources to competing demands is an important problem for efficient design and management of communication networks. The speaker will first present a machine-learning method by using two Coupled Long Short-Term Memory (CLSTM) networks to quickly and robustly produce the optimal or near-optimal allocation of network resources. Numerical examples will be presented to show the effectiveness of the proposed method. The speaker will then give an overview of new approaches to supporting federated learning (FL) and improving the learning process by model pruning and split learning. The FL learns the model parameters from distributed data and adapts according to the limited availability of resources. The key idea of model pruning is to remove unimportant model parameters to reduce computation and communication burden,

while split learning divides the model and learning between the server and user sides. Experimentation results show that the proposed approaches perform near to the optimum or offer significant performance improvement over other methods.

Biography: Kin K. Leung received his B.S. degree from the Chinese University of Hong Kong, and the M.S. and Ph.D. degrees from University of California, Los Angeles. He worked at AT&T Bell Labs and its successor companies in New Jersey from 1986 to 2004. Since then, he has been the Tanaka Chair Professor at Imperial College in London. He was the Head of Communications and Signal Processing Group from 2019 to 2024 and now serves as Co-Director of the School of Convergence Science in Space, Security and Telecommunications at Imperial. His current research focuses on optimization and machine learning for design and control of large-scale communications, computer and quantum networks. He also works on multi-antenna and cross-layer designs for wireless networks.

He is a Fellow of the Royal Academy of Engineering, IEEE Fellow, IET Fellow, and member of Academia Europaea. He received the Distinguished Member of Technical Staff Award from AT&T Bell Labs (1994) and the Royal Society Wolfson Research Merits Award (2004-09). Jointly with his collaborators, he received the IEEE Communications Society (ComSoc) Leonard G. Abraham Prize (2021), the IEEE ComSoc Best Survey Paper Award (2022), the U.S.–UK Science and Technology Stocktake Award (2021), the Lanchester Prize Honorable Mention Award (1997), and several best conference paper awards. He chaired the IEEE Fellow Evaluation Committee for ComSoc (2012-15) and served as the General Chair of the IEEE INFOCOM 2025. He has served as an editor for 10 IEEE and ACM journals and chaired the Steering Committee for the IEEE Transactions on Mobile Computing. Currently, he is an editor for the ACM Computing Survey and International Journal of Sensor Networks.

Ching Yee Suen

Professor, Computer Science and Software Engineering, Concordia University, Canada

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Speech Title: Pattern Recognition, AI, and Their Applications

Abstract: This talk is about (a) Pattern Recognition, the backbone of Artificial Intelligence, ways of recognizing different types of patterns and visible objects using image processing and machine learning methodologies, and (b) AI - Artificial Intelligence, a bit of history, theory, and various applications. We also present the use of ViT, GPT, and deep learning techniques to recognize
handwriting, to measure facial beauty, and to detect fake coins automatically. This system consists of feature measurement, 3D analysis, fuzzy set analysis, advanced PR, AI and ML techniques. For validation, many real world samples have been tested, and a near 100% accuracy hasbeen achieved. Numerous examples will be demonstrated during this talk.

Biography: Prof. Suen is the Honorary Chair of AI and Pattern Recognition of Concordia University in Montreal, Canada. He is also the Founder and Co-Director of the world renowned Centre for Pattern Recognition and Machine Intelligence (CENPARMI). He received an M.Sc. degree from the University of Hong Kong and a Ph.D. from the University of British Columbia. A Principal Investigator or Consultant of 30 industrial projects, Dr. Suen has published 8 conference proceedings, 16 books and more than 630 papers.

Dr. Suen is the recipient of the IAPR 2020 King-Sun Fu Prize (top honour in the field of Pattern Recognition given to only one person every two years) for "Pioneering research and exceptional contributions

to handwriting recognition" leading to the modern way of writing messages with a finger on the surface of cell phones. As a former Editor-in-Chief of the Pattern Recognition Journal for ten years, he received the Elsevier Award of Excellence (2016), Gold Medal from the University of Bari (Italy 2012), CIPPR and ICDAR Awards (2005), the very prestigious ITAC/NSERC national award of $50,000 (1992, together with Prof. G. Hinton of Toronto), and numerous others.

Prof. Suen is not only the founder of three international conferences: ICDAR, IWFHR/ ICFHR, and ICPRAI, but is also the General Chair of many international conferences around the world including ICPR, ICDAR, ICFHR, ICPRAI, ICCPOL, and Honorary Chair of numerous others. He has supervised 120 doctoral and master students to completion, and guided/hosted 100 long-term visiting scientists and professors. Currently, he is the Emeritus Editor-in-Chief of the journal of Pattern Recognition, an Adviser or Associate Editor of 5 other journals, and Editor of a new book series on Language Processing, Pattern Recognition, and Intelligent Systems. For details, click https://www.concordia.ca/faculty/ching-yee-suen.html

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Ka-Chun Wong

Associate Professor, Department of Computer Science, City University of Hong Kong, China

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Speech Title: AI for Science: Molecular Biology and Medicine

Abstract: In recent years, the integration of Artificial Intelligence (AI) in scientific research has revolutionized the field of molecular biology and medicine. This keynote speech aims to explore three significant aspects of computational intelligence in molecular biology and medicine. In particular, we will go from basic research to clinical research: bioinformatics, medical informatics, and clinical solutions. By leveraging computational intelligence and generative AI, we have enabled breakthroughs in DNA motif analysis, cancer detection, gene editing, and small-molecule drug discovery.

1. Bioinformatics: DNA motifs and gene regulation
Bioinformatics has been greatly enhanced by AI techniques, particularly in the analysis of DNA motifs and gene regulation. Pattern recognition algorithms have proven instrumental in identifying and understanding the intricate patterns within DNA sequences. These algorithms aid in deciphering gene regulatory elements, enabling researchers to unravel the complexity of genetic networks and their impact on cellular processes. Through AI-powered bioinformatics, we have gained deeper insights into the fundamental mechanisms governing gene expression and regulation.

2. Medical informatics: Cancer detection and localization
AI has played a pivotal role in medical informatics, particularly in the realm of cancer detection and localization. Machine learning algorithms have demonstrated remarkable accuracy in analyzing complex medical data, such as radiological images and genomic profiles. By training models on vast datasets, AI can identify subtle patterns indicative of cancerous cells, assisting in early detection and precise localization of tumors. This breakthrough empowers clinicians to make informed decisions, leading to improved patient outcomes and personalized treatment strategies.

3. Clinical solutions: gene editing and small-molecule drug discovery
AI has propelled clinical solutions to new heights, particularly in gene editing and small-molecule drug discovery. With the aid of diffusion models, researchers can simulate and predict the behavior of genetic modifications and their impact on cellular functions. This enables precise gene editing, offering potential therapeutic interventions for genetic disorders. Additionally, AI-driven drug discovery and docking techniques have accelerated the identification of small-molecule compounds with the potential to target specific disease pathways. By

leveraging AI in clinical settings, we are witnessing a paradigm shift towards personalized medicine and tailored treatments.

Biography: Ka-Chun Wong was born and raised in Hong Kong where he was lucky enough to be immersed in a multi-cultural environment. He received his B.Eng. in Computer Engineering from United College, The Chinese University of Hong Kong in 2008. He has also obtained his M.Phil. degree in the Department of Computer Science and Engineering at the same university in 2010. From 2011 to 2014, he has spent 3.5 years to finish his PhD degree in the Department of Computer Science at the University of Toronto. Right after his PhD study, Ka-Chun has started his research lab in the Department of Computer Science, City University of Hong Kong. His research group works have been published on Nature Communications, Advanced Science, Nucleic Acids Research, iScience (Cell Press), Briefings in Bioinformatics, Bioinformatics, IEEE/ACM Transactions, NeurIPs, AAAI, IJCAI, ICONIP, and others. He is on the editorial boards and committees of international journals and conferences. Multiple keynote and invited speeches have been delivered worldwide. He was an ACM Distinguished Speaker from 2019 to 2022. He was ranked among the Stanford's top 2% most highly cited scientists for the recent three years (versions 5,6,7).

Yik-Chung Wu

Associate Professor, Department of Electrical and Electronic Engineering, The University of Hong Kong, China

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Speech Title: Tuning-free Matrix and Tensor Factorizations in Machine Learning

Abstract: Matrix and Tensor factorizations are important data analytic tools in many applications, such as recommendation systems, image completion, social network data mining, wireless communications, etc. Traditionally, matrix and tensor factorizations are approached from optimization perspective. While proven to be effective, optimization-based matrix and tensor factorizations usually involve hyperparameters tuning, with one of the major hyperparameters being the matrix or tensor rank. However, when the number of hyperparameters is more than 3 or 4, tuning them becomes computationally expensive. This talk approaches the problem from the Bayesian perspective and shows how hyperparameter tuning can be eliminated while providing comparable or even better performance than corresponding optimization-based algorithms.

Biography: Yik-Chung Wu received the B.Eng. (EEE) degree in 1998 and the M.Phil. degree in 2001 from the University of Hong Kong (HKU). He received the Croucher Foundation scholarship in 2002 to study Ph.D. degree at Texas A&M University, College Station, and graduated in 2005. From August 2005 to August 2006, he was with the Thomson Corporate Research, Princeton, NJ, as a Member of Technical Staff. Since September 2006, he has been with HKU, currently as an Associate Professor. He was a visiting scholar at Princeton University, in summers of 2015 and 2017. His research interests are in general areas of machine learning and signal processing, and in particular Bayesian inference, distributed algorithms, and large-scale optimization. Dr. Wu served as an Editor for IEEE Communications Letters, and IEEE Transactions on Communications. He is currently a Senior Area Editor for IEEE Transactions on Signal Processing, an Associate Editor for IEEE Wireless Communications Letters, and an Editor for Journal of Communications and Networks. He received four best paper awards in international conferences, with the most recent one from IEEE International Conference on Communications (ICC) 2020. He was a symposium chair for many international conferences, including IEEE International Conference on Communications (ICC) 2023 and IEEE Globecom 2025. He was elected the Best Editor of the year 2023 in IEEE Wireless Communications Letters. He is an elected member of IEEE signal processing society SPCOM Technical Committee (2025-2026), and an IEEE Distinguished Lecturer (Vehicular Technology Society 2025 class).

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