Keynote Speakers

Kin K. Leung

Tanaka Chair Professor, Imperial College, London

Kin K. Leung received his 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 in the Electrical and Electronic Engineering and Computing Departments 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 serves 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.

Keynote Title: Optimization and Federated Learning for Edge Computing with Resource Constraints

Abstract: Allocation of limited resources to competing demands is an important problem for efficient design and management of computing services at network edge. 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 resource allocation. 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.

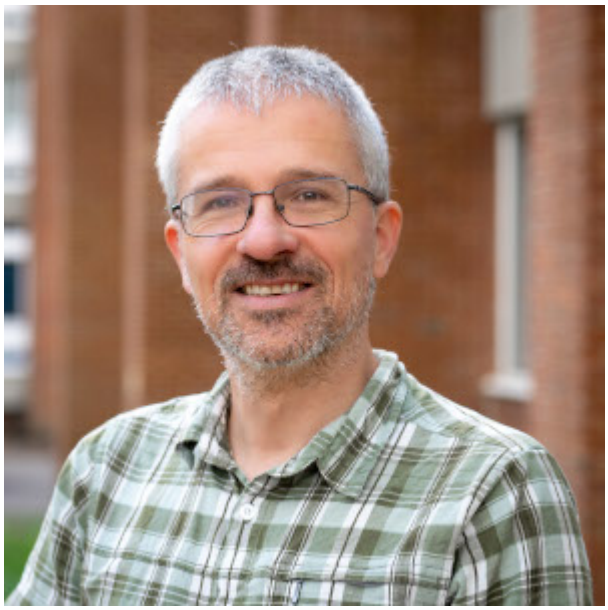
Wenwu Wang

Professor, University of Surrey

Wenwu Wang is a Professor in Signal Processing and Machine Learning and an Associate Head in External Engagement, School of Computer Science and Electronic Engineering, University of Surrey, UK. He is also an AI Fellow at the Surrey Institute for People Centred Artificial Intelligence. His current research interests include signal processing, machine learning and perception, artificial intelligence, machine audition (listening), and statistical anomaly detection. He has (co)-authored over 400 papers in these areas.

Keynote Title: Large Language-Audio Models and Applications

Abstract: Large Language Models (LLMs) are being explored in audio processing to interpret and generate meaningful patterns from complex sound data, such as speech, music, environmental noise, sound effects, and other non-verbal audio. Combined with acoustic models, LLMs offer great potential for addressing a variety of problems in audio processing, such as audio captioning, audio generation, source separation, and audio coding. This talk will cover recent advancements in using LLMs to address audio-related challenges. Topics will include the language-audio models for mapping and aligning audio with textual data, their applications across various audio tasks, the creation of language-audio datasets, and potential future directions in language-audio learning. We will demonstrate our recent works in this area, for example, AudioLDM, AudioLDM2 and WavJourney for audio generation and storytelling, AudioSep for audio source separation, ACTUAL for audio captioning, SemantiCodec for audio coding, WavCraft for content creation and editing, and APT-LLMs for audio reasoning, and the datasets WavCaps, Sound-VECaps, and AudioSetCaps for training and evaluating large language-audio models.



Thomas Nowotny

Head of AI Research Group, Sussex AI, University of Sussex

Thomas Nowotny has a background in theoretical and mathematical physics, with a Diplom (MSc) in theoretical Physics at Georg-August Universität Göttingen and a PhD in theoretical Physics at Universität Leipzig. After his PhD, he worked at the Institute for Nonlinear Science at the University of California, San Diego where he conducted research in Computational Neuroscience and bio-inspired AI. In 2007, he moved to the University of Sussex as an RCUK Academic Fellow and rapidly climbed the ranks to Professor of Informatics in the School of Engineering and Informatics. He is the head of the AI research group and one of two directors of the “Sussex AI” Centre of Excellence. His research spans insect olfaction, artificial olfaction, insect navigation, insect-inspired machine learning models, hybrid brain-computer systems and neuromorphic computing. He is the creator of the research software STDPC for hybrid brain-computer experimentation and GeNN/mlGeNN for simulating spiking neural networks and performing event-based machine learning. His recent work is focused on decarbonising AI by developing event-based neural networks that run on neuromorphic accelerators to save orders of magnitude of energy in machine learning.

Keynote Title: Decarbonising AI with event-based neural networks

Abstract: This talk is about how to train event-based neural networks for more energy-efficient AI. I will briefly discuss the adjoint method for calculating exact gradients in event-based neural networks and demonstrate how it scales beneficially with the length of the input sequence. I will also discuss the deployment of trained networks on the Intel Loihi 2 neuromorphic system and the achievable energy savings. I will conclude with a discussion of the potential of event-based neural networks for AI and neuromorphic computing.

Peter Mueller

University of Basel, Switzerland and École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Switzerland

Peter Mueller is a senior scientist at the University of Basel and EPFL. He was a Research Staff Member at IBM Research for more than 35 years. His research expertise covers a wide range of technologies, including distributed computing systems architecture, microwave technology, device physics, nanoscience and modelling. His current research area is in the fields of quantum technology, mainly applied to quantum computing. Peter is a founding member and was the Chair of IEEE ComSoc's technical committees on Communications and Information

Systems Security (CIS-TC) and Quantum Communications and Information Technology (QCIT). He also is a member of the Industrial and Applied Mathematics Society, the Electrochemical Society, and the Swiss and the American Physical Societies.

Keynote Title: The 100-year journey to quantum computing

Abstract: Over 100 years ago, scientists began observing quantization effects. Their findings led to a new picture of reality that does not always correspond to our intuitive experience. The resulting mathematical framework is now known as quantum mechanics. Quantum mechanics has been a strong driver for many technological developments, whose products we use every day and for our current worldview. About 30 years ago, reports showed quantum mechanics could be used for digital processing.
This talk will discuss the key phases of the technological revolution and current developments that enable quantum computing. Finally, the current state of selected device technologies, algorithms, and economic aspects will be presented.

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