



Connected System for an AI-enabled World

UCL Workshop sponsored by Huawei

14th December 2023

Wellcome Collection

London, UK

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Interconnected communication systems have penetrated almost all aspects of our society, having long elevated communication to one of the basic human needs. This development has recently been complemented with an ever stronger drive towards utilizing the progress in artificial intelligence (AI) to enrich service experiences as well as create entirely new ones but also to improve the workings of communication systems themselves. The interplay between compute and network resources is crucial to making this development a reality, not just within ever more powerful data centres but also in the fabric that interconnects them.

This workshop brings together world-renowned experts in the field of networking and AI to explore the exciting interplay of both to present and discuss cutting edge developments in future connected experiences, enabled by systems build around and with AI through methods for increased utilization of system awareness to ensure an ever increasing capacity that can be utilized for those novel experiences. The workshop format places a strong emphasis on deep technical presentations and discussions in order to increase the takeaway for the participating audience, while also leaving time for interaction through question and answer time. A panel at the end of the day will bring the insights of the day together to tease out the possibly biggest obstacle in future development that our experts may see as of today; a discussion perfect for being continued over dinner that will be offered for all workshop attendees to deepen discussions and enjoy social drinks.

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AGENDA

UK Time	Theme	Name	Affiliation
9:00 – 9:10	Introduction	Welcome Speech from UCL	
9:10 – 9:20		Welcome Speech from Huawei	
9:20 – 9:50		Dr. Zhe Chen	Huawei
9:50 – 10:25	Creating and Utilizing System Awareness	Dr. David Griffin	UCL
10:25 – 10:45	Break		
10:45 – 11:20	Future Connected Experiences	Dr. Ignacio Castro	Queen Mary University of London
11:20 – 12:00	Built around and with AI	Prof. Mark Handley	UCL
12:00 – 12:40		Prof. George Zervas	UCL
12:40 – 14:00	Lunch		
14:00 – 14:40	Built around and with AI	Prof. DK Panda	Ohio State University
14:40 – 15:20		Prof. Noa Zilberman/Changgang Zheng	University of Oxford
15:20 – 16:00	Creating and Utilizing System Awareness	Prof. Gianni Antichi	Politecnico di Milano
16:00 – 16:15	Break		
16:15 – 16:55	Future Connected Experiences	Dr. Anna Maria Mandalari	UCL
17:00 – 17:30	Panel discussion		

**Drinks reception and dinner from 6:30pm:
Hilton London Euston, 17-18 Upper Woburn Place, London, WC1H 0HT**

Invited Speakers



Mr. Shaowei Liu

Mr. Shaowei Liu has been appointed as the president of Huawei European Research Institute (ERI) since 2023. He is mainly responsible for Huawei's European research, standardization, technical cooperation activities, research talent development and ERI daily management.

Since joining Huawei in 1999, Mr. Shaowei Liu participated in the research and development of core routers, campus network, data centre network, Wi-Fi, network security, optical network, access network, video conference. He has held many key positions, including president of data communication R&D, president of network R&D, president of enterprise network product line, general manager of core router, director of router life cycle management team, manager of forwarding software department, chief architect of forwarding software, etc.

Mr. Shaowei Liu graduated from Northwestern Polytechnical University, China in 1998 with a master's degree in engineering.

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Dr. Zhe Chen

Dr. Zhe Chen is a researching expert of Huawei Network Technology Lab. He is researching on network architecture and protocols, especially on routing and transport protocols.



Dr. Ignacio Castro

Ignacio Castro is Assistant Professor at Queen Mary University of London and Chair at the Research and Analysis of Standard-Setting Processes proposed Research Group (RASP RG). He obtained his PhD while researching at the Institute IMDEA Networks (Madrid, Spain), and visiting UC Berkeley (California, USA). His work sits at the intersection between economics and computer systems and his interest spans from online social networks and moderation to the macroscopic evolution of the Internet. He has been an investigator on three major EPSRC grants that hold over £6 million in funding and his work appears in top tier journals and conferences including ACM SIGCOMM, ACM SIGMETRICS, ACM IMC, AAAI ICWSM, WWW, and IEEE/ACM Trans. on Networking. He also serves in TPCs and organises top tier conferences including SIGCOMM, IMC, and CoNEXT.

Invited Speakers



Dr. David Griffin

David Griffin is a Principal Research Associate in the Communications and Information Systems Group, Department of Electronic and Electrical Engineering, University College London. He has a BSc in Electronic, Computer and Systems Engineering from Loughborough University and a PhD in Electronic and Electrical Engineering from UCL.

Before joining UCL Dr Griffin was a Systems Design Engineer at GEC-Plessey Telecommunications (now part of Ericsson) where he worked on the management of ATM networks. In 1993, he joined the Foundation for Research and Technology, Institute of Computer Science, Greece as a Research Associate in Telecommunications where he worked on ATM network optimisation and performance management.

He has led several international collaborative research projects, most recently on the topics of the co-optimisation of peer-to-peer content distribution overlays and underlying network infrastructures, and on the optimisation of edge clouds for delivering high-performance, low-latency applications. He is currently leading the work package in a large EU project on the delivery of interactive media applications over 5G networks.

His research interests are in planning, management and dynamic control for providing QoS in multi service networks, edge computing, novel Internet routing paradigms, software-defined networks and network function virtualisation.

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Prof. George Zervas

George Zervas is currently Professor of Optical Networked Systems in the Department of Electrical and Electronic Engineering at University College London. He received his MEng degree in Electronic and Telecommunication Systems Engineering with distinction and PhD degree in optical networks from the University of Essex in 2003 and 2009 respectively. Following this, George held the positions of Research Associate and subsequently Research Fellow and Lecturer as a member of the High-Performance Networks Group at the University of Essex where he investigated multi-granular optical switching.

Between 2012-16 he was appointed Lecturer and Senior Lecturer at the University of Bristol where he led the research activities on optical networked systems with an emphasis on optical switching, flexible and space division multiplexed networking, programmable electronic and optical hardware as well as data centre systems. He also held the position of Visiting Associate Professor at Keio University, Tokyo. He is the recipient of the prestigious 5-year Fellowship from the Engineering and Physical Sciences Research Council (EPSRC) within Information and Communications Technology in the U.K.

He is the author and co-author of over 275 international peer-reviewed journal and conference papers including numerous prestigious post-deadline papers at ECOC/OFC as well as best paper awards. He has also given over 40 invited talks at several international conferences. His research interests lie in the fields of optical networked systems for data centres, high-performance computing, and telecoms with a particular focus on optical switched interconnects, topologies, control, architectures and compute and network co-design.

George is currently an EPSRC Fellow (OptoCloud) and co-investigator on the TRANSNET programme grant. His research has been funded and supported by industry partners including Microsoft, Huber+Suhner Polatis, British Telecom, Sumitomo Electric, II-VI, Xilinx and Micron.

Invited Speakers



Prof. Mark Handley FRS

Mark Handley FRS is Professor of Networked Systems at UCL in the Networks Research Group, which has a long history dating back to 1973 when UCL became the first site outside the United States to join the ARPAnet, which was the precursor to today's Internet. Prior to joining UCL, Professor Handley was based at the International Computer Science Institute in Berkeley, California, where he co-founded the AT&T Centre for Internet Research at ICSI (ACIRI). Professor Handley has been very active in the area of Internet Standards, and has served on the Internet Architecture Board, which oversees much of the Internet standardisation process. He is the author of 33 Internet standards documents (RFCs), including the Session Initiation Protocol (SIP), which is the principal way telephony signalling is performed in Internet-based telephone networks. He came up with the concept and co-authored the standard for Multipath TCP, which allows connections to move seamlessly between networks, such as when a phone moves from WiFi to 5G. More recently he devised NDP and EQDS to allow data centre networks to operate at high capacity. His startup developing EQDS was acquired by Broadcom in 2022, and the key elements from EQDS are now being standardized in the Ultra Ethernet Consortium to drive the next generation of very large AI clusters.

Professor Handley's research interests include the Internet architecture (how the components fit together to produce a coherent whole), congestion control (how to match the load offered to a network to the changing available capacity of the network), Internet routing (how to satisfy competing network providers' requirements, while ensuring that traffic takes a good path through the network), and defending networks against denial-of-service attacks. He founded the XORP project to build a complete open-source Internet routing software stack. More recently he has worked on networking in mega-constellations such as SpaceX's Starlink network, and on large-scale high-performance data centre networks for the most demanding AI workloads.

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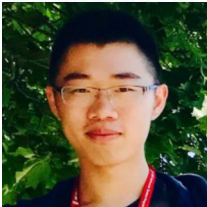
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Prof. Dhabaleswar K. (DK) Panda

DK Panda is a Professor and University Distinguished Scholar of Computer Science and Engineering at the Ohio State University. He is serving as the Director of the ICICLE NSF-AI Institute (<https://icicle.ai>). He has published over 500 papers. The MVAPICH2 MPI libraries, designed and developed by his research group (<http://mvapich.cse.ohio-state.edu>), are currently being used by more than 3,300 organizations worldwide (in 90 countries). More than 1.74 million downloads of this software have taken place from the project's site. This software is empowering many clusters in the TOP500 list. High-performance and scalable solutions for Deep Learning frameworks and Machine Learning applications from his group are available from <https://hidl.cse.ohio-state.edu>. Similarly, scalable and high-performance solutions for Big Data and Data science frameworks are available from <https://hibd.cse.ohio-state.edu>. Prof. Panda is an IEEE Fellow and recipient of the 2022 IEEE Charles Babbage Award.

Invited Speakers



Mr. Changgang Zheng

Changgang Zheng is a final-year DPhil student supervised by Prof. Noa Zilberman in Computing Infrastructure Group in Engineering Science at the University of Oxford. His research interests include networking, in-network computing, and machine learning. His specific interest includes applying in-network computing and machine learning techniques to address networking challenges.

The Computing Infrastructure Group is engaged in a wide range of research aspects related to Computer Engineering, with a focus on building Scalable, Sustainable and Resilient computing infrastructure.

The group uses micro-architectures to improve system-scale and application level performance. Examples include using programmable devices to design new data driven accelerator platforms, building high-performance networked-systems, improving power-efficiency in cloud computing, re-imagining server architectures, and more. The research is implementation-driven, producing working prototypes.

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Prof. Gianni Antichi

Gianni Antichi is an Associate Professor at Dipartimento Elettronica, Informazione e Bioingegneria of Politecnico di Milano (Italy) and Senior Lecturer (Associate Professor) at the School of Electronic Engineering and Computer Science of Queen Mary University of London (United Kingdom). His research interests sit at the intersection of networks and systems and the goal is to develop hardware/software co-designs to improve performance and efficiency of end-host applications as well as packet-processing programs. He received a PhD in Information Engineering from the University of Pisa (Italy). His awards include the best paper at ACM SIGCOMM 2017, the ACM SOSR system 2019 as part of the NetFPGA project, the EPSRC New Investigator and the Facebook Networking Systems Research RFP in 2020.



Dr. Anna Maria Mandalari

Anna Maria Mandalari works as Assistant Professor at University College London (UCL). She is affiliated with the Electronic & Electrical Engineering Department and member of the UCL's Academic Centre of Excellence in Cyber Security Research (ACE-CSR). She has been nominated member of the Italian Technical Committee for strategies on the use of AI. She is Honorary Research Fellow at the Institute for Security Science and Technology at Imperial College London and expert fellow of the UK SPRITE+ Hub. She obtained her PhD within the framework of the METRICS project, which is part of the Marie Skłodowska-Curie action, intended for excellent researchers, affiliated with the Carlos III University of Madrid. Her research interests are Internet of Things (IoT), privacy, security, networking and Internet measurement techniques. She studies privacy implications and information exposure from IoT devices. She works on the problem of modelling, designing, and evaluating adaptation strategies based on Internet measurements techniques. In addition to her research, Anna gives invited talks all around the world to promote research and create awareness on security, privacy, and ethical AI. Most of her research experiences have also significantly contributed to several EU-funded research projects and have had a significant influence on media and policy-making.



Prof. Christos Masouros

Christos Masouros (SMIEEE, MIET) received the Diploma degree in Electrical and Computer Engineering from the University of Patras, Greece, in 2004, and MSc by research and PhD in Electrical and Electronic Engineering from the University of Manchester, UK in 2006 and 2009 respectively. In 2008 he was a research intern at Philips Research Labs, UK. Between 2009-2010 he was a Research Associate in the University of Manchester and between 2010-2012 a Research Fellow at Queen's University Belfast. In 2012 he joined University College London as a Lecturer. He has held a Royal Academy of Engineering Research Fellowship between 2011-2016.

He is currently a Full Professor in the Information and Communications Engineering research group, Dept. Electrical and Electronic Engineering, University College London. His research interests lie in the field of wireless communications and signal processing with particular focus on Green Communications, Large Scale Antenna Systems, Cognitive Radio, interference mitigation techniques for MIMO and multi-carrier communications. He was the recipient of the Best Paper Awards in the IEEE GlobeCom 2015 and IEEE WCNC 2019 conferences, and has been recognised as an Exemplary Editor for the IEEE Communications Letters, and as an Exemplary Reviewer for the IEEE Transactions on Communications. He is an Editor for IEEE Transactions on Communications, and IEEE Transactions on Wireless Communications. He has been an Associate Editor for IEEE Communications Letters, and a Guest Editor for IEEE Journal on Selected Topics in Signal Processing issues "Exploiting Interference towards Energy Efficient and Secure Wireless Communications" and "Hybrid Analog / Digital Signal Processing for Hardware-Efficient Large Scale Antenna Arrays". He is currently an elected member of the EURASIP SAT Committee on Signal Processing for Communications and Networking.

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Dr. Dirk Trossen

Dr. Dirk Trossen is a Chief Network Architecture Researcher at Huawei's Applied Network Technology Laboratory. His main responsibility lies in researching new network technologies for the Next Generation Internet and data centre technologies through engagements within the relevant SDOs, EU-funded work programmes as well as direct university relations. Dirk has more than 25 years of experience in network architectures, services and wireless technology with main contributions in the area of inter-domain networking as well as seamless handovers, physical network overlays and new service concepts for operators. Prior to joining Huawei, Dirk was a Senior Principal Engineer at InterDigital Europe, Ltd, leading the network research team in the London office as the technical lead of the H2020 POINT, RIFE and FLAME projects on service-based architectures. Until April 2013, Dirk was a Senior Researcher at the Computer Laboratory of Cambridge University. Prior to this, Dirk was Chief Researcher at BT Research from 2007 to 2009 and Senior Principal Scientist with Nokia Research from 2000 to 2007. From 2009 to 2019, Dirk was also a Research Affiliate with the Advanced Network Architecture group at MIT CSAIL. He holds a Ph.D. degree in Computer Science from Technical University of Aachen, Germany and diploma degree in Mathematics from the same university. He published more than 90 peer-reviewed papers in international conferences and journals and holds currently more than 30 international patents in various areas.

Panelists



Prof. Miguel Rio

Miguel Rio is a Professor of Computer Networks in the Department of Electronic and Electrical Engineering at University College London. He holds a Meng and MSc from the University of Minho, Portugal and a PhD from the University of Kent, United Kingdom. He has been a Principal Investigator in numerous research projects funded by the UK government, the European Union, industry and the US/UK military. His current interests include edge networking, software defined networking, network resilience and improving network quality of experience.



Dr. Haiyu Mao

Dr. Haiyu Mao is a Senior Researcher in the SAFARI Research group at ETH Zurich, Switzerland. In July 2020, she received her Ph.D. degree from Tsinghua University, China. Her research interests include computer architecture and system, non-volatile memory, processing in memory, memory security, bioinformatics, and machine learning accelerators.

