38TH IEEE INTERNATIONAL PERFORMANCE COMPUTING AND COMMUNICATIONS CONFERENCE

SAMSUNG

Samsung Austin R&D Center

LONDON, UNITED KINGDOM

OCTOBER 29 - 31, 2019

IPCCC.ORG

Message from the IPCCC 2019 General Co-Chairs

It is our great pleasure to warmly welcome you to the 38th IEEE International Performance, Computing, and Communications Conference (IPCCC 2019) at London, UK.

IPCCC 2019 brings together researchers from academia, government, and industry all around the world to exchange their latest research achievements in computer and communication systems, as well as to inspire each other through discussion and presentations. We are very proud to see a high-quality conference program, including two keynote speeches, 39 full papers, 17 short papers, and 9 posters.

Firstly, we would like to thank all authors of the submitted and accepted papers. Their contributions keep the research in the field active and make this conference a lively place for research discussions.

Secondly, we would like to express our appreciation to Program Co-Chairs Nils Aschenbruck and Ningfang Mi, all members of the Technical Program Committee, as well as external reviewers for their tremendous effort and hard work in paper selection. Their timely feedback is very valuable to both the conference and the authors.

Thirdly, we would like to sincerely thank our organizing committee members, including but not limited to General Vice-Chairs Yingshu Li and Fan Li, Short Paper Track Co-Chairs Abdel-Hameed Badawy and Bo Sheng, Poster Chair Jiangtao Wang, Publication Chair Dazhao Cheng, Publicity Chairs Gurkan Solmaz, Dusit Niyato, and Wenjia Li, Special Projects Chair Kathlene Hurt, Web Chair Neil Nelson, Financial Chair Nasr Ullah, and Registration Chair Jack Chen, for their enormous support and contributions. Their time and efforts make the conference possible.

It has been a privilege for us to work with such a marvelous group of dedicated professionals. Last but not least, we would like to thank the IEEE Computer Society, and Samsung Austin R&D Center (SARC) for their continuing sponsorship and support of this conference.

On behalf of the conference Executive Committee, we welcome you to IPCCC 2019 in London. We do hope that you will enjoy the technical programs and events, and have a wonderful time!

– Yu Wang and Mea Wang, IPCCC 2019 General Co-Chairs

Message from the IPCCC 2019 Technical Program Co-Chairs

Welcome to the 38th edition of IEEE International Performance Computing and Communications Conference (IPCCC 2019) in London, UK. We are pleased to continue the tradition of IEEE IPCCC, a premier conference on the performance of computer and communication systems, in offering a high quality technical program in a friendly setting that facilitates close interactions among participants.

IPCCC 2019 received 137 valid full paper submissions. Each paper has received a minimum of three reviews. Out of the 137 full paper submissions, 39 papers have been accepted and the authors submitted the final versions, resulting in an acceptance ratio of 28.4%. In addition, 17 papers were accepted as short papers and 9 were accepted for poster presentations. The IPCCC conference proceedings include full papers, short papers, and poster papers.

We would like to thank many people who have contributed to this year's IPCCC program. We wish to thank the paper authors for their interest and for choosing IPCCC as the channel to present their quality research. We are grateful to the 101 members of the Technical Program Committee and the additional reviewers for providing quality reviews. The program of the conference is based on their work.

We would of course like to thank the IPCCC 2019 Organizing Committee as well as the IPCCC 2019 Steering Committee for their help and support. Finally, we would like to welcome the attendees to the conference and thank them for participating in IPCCC 2019.

We hope that you will enjoy reading the 2019 IEEE IPCCC papers as much as we did, and will find the program interesting and stimulating. Finally, we wish you a pleasant stay in London.

Enjoy IPCCC 2019!

– Nils Aschenbruck & Ningfang Mi, IPCCC 2019 Technical Program Co-Chairs

The International Performance, Computing and Communications Conference is the premier IEEE conference presenting research in the performance of computer and communications systems. For more than three decades IPCCC has been a research forum for academic, industrial and government researchers.

Program Contents

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IPCCC 2019 Day One – Tuesday, October 29

Registration 08:00-08:30 AND Welcome 08:30-09:00 (Gunnell Suite)

Keynote I: 5G & The Internet of Skills In Action: Mischa Dohler, Chair Professor, King's College London

09:00-10:00 (Gunnell Suite) Chair: Yu Wang

Break 10:00-10:30

Session 1: Best Paper Candidates

10:30 AM -12:00 (Gunnell Suite) Chair: Mea Wang

Sphinx: A Transport Protocol for High-Speed and Lossy Mobile Networks: Junfeng Li, Dan Li and Wenfei Wu (Tsinghua University, P.R. China); K. K. Ramakrishnan (University of California, Riverside, USA); Jinkun Geng (Tsinghua University, P.R. China); Fei Gui (University of XiangTan, P.R. China); Fanzhao Wang and Kai Zheng (Huawei Technologies, P.R. China)

Using DCT-based Approximate Communication to Improve MPI Performance in Parallel Clusters: Qianqian Fan, David J. Lilja and Sachin Sapatnekar (University of Minnesota, USA)

Reliability, Timeliness and Load Reduction at the Edge for Cloud Gaming: Antonio Franco (Lund University, Sweden); Emma Fitzgerald (Lund University, Sweden and Warsaw University of Technology, Poland); Bjorn Landfeldt and Ulf Körner (Lund University, Sweden)

Lunch - 12:00-13:30 (Westeleven Restaurant) [Lunch Tickets Must be Picked up at Registration]

Session 2.1: Big Data Processing and Analytics

13:30 -15:30 (Gunnell Suite) Chair: Jan Bauer

ATuMm: Auto-tuning Memory Manager in Apache Spark: Danlin Jia (Northeastern University, USA); Janki Bhimani (Florida International University and Samsung Semiconductors, USA); Nam Nguyen and Bo Sheng (University of Massachusetts, Boston, USA); Ningfang Mi (Northeastern University, USA)

Query Optimization Approach with Shuffle Intermediate Cache Layer for Spark SQL: Mingyu Zhai (NARI Technology, P.R. China); Aibo Song and Jingyi Qiu (Southeast University, P.R. China); Xuechun Ji and Qingxi Wu (NARI Technology, P.R. China)

Adaptive Differentially Private Data Stream Publishing in Spatio-temporal Monitoring of IoT: Teng Wang (Xian Jiaotong University, P.R. China); Xinyu Yang and Xuebin Ren (Xi'an Jiaotong University, P.R. China); Jun Zhao and Kwok-Yan Lam (Nanyang Technological University, Singapore)

ALEAP: Attention-based LSTM with Event Embedding for Attack Projection: Shuhan Fan, Songyun Wu, Zhiliang Wang, Li Zimu and Jiahai Yang (Tsinghua University, P.R. China); Heng Liu (China Electronics Cyberspace Great Wall Co., P.R. China); Xinran Liu (National Computer Network Emergency Response Technical Team, P.R. China)

Session 2.2: Computer Networks

13:30 -15:30 (Christie Room) Chair: Elie Naim Inaty

Cooperative Fair Bandwidth Scaling in Contention-based Wireless Networks Using Time Token Bucket: Christopher Kramer (TU Kaiserslautern, Germany); Reinhard Gotzhein and Kiran Mathews (University of Kaiserslautern, Germany)

QuickR: A Novel Routing Strategy for Wireless Mobile Information-centric Networks: Adita Abhay Kulkarni (State University of New York at Binghamton, USA); Anand Seetharam (SUNY Binghamton, USA)

Exploiting Social Network Characteristics for Efficient Routing in Ocean Vessel Ad Hoc Networks: Qihang Bing, Ruobing Jiang and Feng Hong (Ocean University of China, P.R. China)

***Accelerating QUIC's Connection Establishment on High-Latency Access Networks:** Erik Sy (Universität Hamburg, Germany); Tobias Mueller, Moritz Moennich and Hannes Federrath (University of Hamburg, Germany)

***A Comprehensive Study of Accelerating IPv6 Deployment:** Tianyu Cui (University of Chinese Academy of Science, P.R. China); Chang Liu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Gaopeng Gou and Junzheng Shi (Institute of Information Engineering Chinese Academy of Sciences, P.R. China); Gang Xiong (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

Break 15:30 - 16:00

Session 3.1: Deep Learning

16:00-18:00 (Gunnell Suite) Chair: Ningfang Mi

Towards Industrial IoT-AR Systems Using Deep Learning-Based Object Pose Estimation: Yongbin Sun and Sai Nithin Reddy Kantareddy (Massachusetts Institute of Technology, USA); Joshua Siegel (Michigan State University, USA); Alexandre Armengol-Urpi (Massachusetts Institute of Technology, USA); Xiaoyu Wu (Boston University, USA); Hongyu Wang (University of Miami, USA); Sanjay Sarma (Massachusetts Institute of Technology, Auto-ID Center, USA)

A Deep Learning Approach to Dynamic Passive RTT Prediction Model for TCP: Desta Haileselassie Hagos (University of Oslo & Faculty of Mathematics and Natural Sciences, Norway); Paal E. Engelstad (Oslo and Akershus University College, University of Oslo/UNIK and FFI, Norway); Anis Yazidi (Oslo Metropolitan University, Norway); Carsten Griwodz (Simula Research Laboratory, Norway)

Topology-aware Sparse Allreduce for Large-scale Deep Learning: Truong Thao Nguyen (National Institute of Advanced Industrial Science and Technology AIST, Japan); Mohamed Wahib (Advanced Institute for Computational Science, RIKEN, Japan); Ryousei Takano (National Institute of Advanced Industrial Science and Technology AIST, Japan)

***Energy and Delay Co-aware Computation Offloading with Deep Learning in Fog Computing Networks:** Xi Zhu, Siguang Chen, Songle Chen and Geng Yang (Nanjing University of Posts and Telecommunications, P.R. China)

Session 3.2: Security - Hide and Seek

16:00-18:00 (Christie Room) Chair: Assia Tria

Deanonymizing Tor in a Stealthy Way: Jianjun Lin (University of Chinese Academy of Sciences, P.R. China); Jianbo Gao and Zhenhao Wu (Peking University, P.R. China); Chengxiang Si and Bo Sun (National Computer Network Emergency Response Technical Team/Coordination Center of China, P.R. China)

Identify OS from Encrypted Traffic with TCP/IP Stack Fingerprinting: Xinlei Fan (University of Chinese Academy of Sciences, P.R. China); Gaopeng Gou (Institute of Information Engineering Chinese Academy of Sciences, P.R. China); Cuicui Kang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Junzheng Shi (Institute of Information Engineering Chinese Academy of Sciences, P.R. China); Gang Xiong (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

A Byte-level CNN Method to Detect DNS Tunnels: Chang Liu and Liang Dai (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Wenjing Cui (Institute of Information Engineering, Chinese Academy of Sciences and University of Chinese Academy of Sciences, P.R. China); Tao Lin (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

***VPGA: An SDN-based Location Privacy Zones Placement Scheme for Vehicular Networks:** Abdelwahab Boualouache and Ridha Soua (University of Luxembourg, Luxembourg); Thomas Engel (University of Luxemburg, Luxembourg)

***Trust-based Model with Protection Against RSU Attacks in Vehicular Networks:** Aljawharah Alnasser (King Saud University, Saudi Arabia and Durham University, United Kingdom); Hongjian Sun (Durham University, United Kingdom)

Reception with Posters Chair: Jiangtao Wang – 18:00 - 20:00 (Atrium Lounge)

A C++ Library for Tensor Decomposition: Jiapeng Huang and Linghe Kong (Shanghai Jiao Tong University, P.R. China); Xiao-Yang Liu (Columbia University, USA); Wenhao Qu and Guihai Chen (Shanghai Jiao Tong University, P.R. China)

IoT Meets Distributed AI-deployment Scenarios of Bonseyes AI Applications on FIWARE: Lucien Moor, Lukas Bitter and Migurel De Prado (HE-Arc, Switzerland); Nuria Pazos and Nabil Ouerhani (Applied Science University Western Switzerland, Switzerland)

reZig: Decompose a Collision via Reference Waveform: Yifeng Cao, Zhe Wang, Linghe Kong and Guihai Chen (Shanghai Jiao Tong University, P.R. China)

Scheduling Dependent Tasks in Edge Networks: Mohammed Maray (University of Warwick and King Khalid University, United Kingdom); Arshad Jhumka and Adam Chester (University of Warwick, United Kingdom); Mohamed Younis (University of Maryland Baltimore County, USA)

CLR: A Classification of DNS Tunnel Based on Logistic Regression: Kemeng Wu (University of Chinese Academy of Science, P.R. China)

High-precision Adaptive Slope Compensation Circuit for System-on-Chip Power Management; Hua Fan (University of Electronic Science and Technology of China, P.R. China)

Contract-network Protocol: An Efficient Communication Protocol for Distributed Ledger Technology: Yibin Xu (Cardiff University); Yangyu Huang (FZU, P.R. China)

CAN't - An ISOBUS Privacy Proxy for Collaborative Smart Farming: René Helmke (University of Osnabrück, Germany); Jan Bauer (University of Osnabrück & Institute of Computer Science, Germany); Alexander Bothe and Nils Aschenbruck (University of Osnabrück, Germany)

Mining Cross-platform User Behaviors for Demographic Attribute Inference: Haoran Xu, Yuqing Sun and Xiangjun Li (Shandong University, P.R. China)

*Denotes Short Paper

IPCCC 2019 Day Two – Wednesday, October 30

Registration 08:00-08:30 (Gunnell Suite)

Keynote II: The Many Layers of Delay Requirements: Carsten Griwodz, Professor, University of Oslo
08:30-09:30 (Gunnell Suite) Chair: Mea Wang

Break 09:30 - 10:00

Session 4.1: Caching
10:00-12:00 (Gunnell Suite) Chair: Yu Wang

GPUs Cache Performance Estimation Using Reuse Distance Analysis: Yehia Arafa (New Mexico State University, USA); Gopinath Chennupati (Los Alamos National Laboratory, USA); Atanu Barai and Abdel-Hameed A Badawy (New Mexico State University, USA); Nandakishore Santhi and Stephan Eidenbenz (Los Alamos National Laboratory, USA)

Emulate Processing of Assorted Database Server Applications on Flash-Based Storage in Datacenter Infrastructures: Janki Bhimani (Florida International University and Samsung Semiconductors, USA); Rajinikanth Pandurangan (Samsung, USA); Ningfang Mi (Northeastern University, USA); Vijay Balakrishnan (Samsung, USA)

Data Heat Prediction in Storage Systems Using Behavior Specific Prediction Models: Lu Pang, Anis Alazzawe and Krishna Kant (Temple University, USA); Jeremy Swift (Dell EMC Inc., USA)

An Almost-zero Latency Lightweight Mechanism for Caching Decision in ICN Content Router: Yang Qifeng (UCAS and Institute of Acoustics of Chinese Academy of Sciences, P.R. China); Yiqiang Sheng (Chinese Academy of Sciences, P.R. China)

Session 4.2: Security - Network Intrusion Detection
10:00-12:00 (Christie Room) Chair: Nils Aschenbruck

Efficient Attack Correlation and Identification of Attack Scenarios Based on Network-motifs: Steffen Haas (University Hamburg, Germany); Florian Wilkens (Universität Hamburg, Germany); Mathias Fischer (University Hamburg, Germany)

A New C&C Channel Detection Framework Using Heuristic Rule and Transfer Learning: Jianguo Jiang, Qilei Yin, Zhixin Shi, Meimei Li and Bin Lv (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

Autonomous Detection of Synchronization Attacks in the Industrial Internet Of Things: Meriem Smache (CEA, France); Alexis Olivereau (CEA, List Institute, France); Thibault Franco-Rondisson (CEA, France); Assia Tria (French Alternative Energies and Atomic Energy Commission, France)

Exploiting Temperature-varied ECU Fingerprints for Source Identification in In-vehicle Network Intrusion Detection: Miaoqing Tian, Ruobing Jiang, Chaoqun Xing, Haipeng Qu, Qian Lu and Xiaoyun Zhou (Ocean University of China, P.R. China)

Lunch (Westeleven Restaurant) 12:00-13:30 [Lunch Tickets Must be Picked up at Registration]

Session 5.1: System Performance & Testbeds
13:30-15:30 (Gunnell Suite) Chair: Shijie Jia

Quantitative Analysis of Mobile Application User Interface Design: Zexun Jiang and Hao Yin (Tsinghua University, P.R. China); Yan Luo (University of Massachusetts Lowell, USA); Jiaying Gong (Virginia Polytechnic and State University, USA); Yuannan Yang (Johns Hopkins University, USA); Manshan Lin (Northwestern University, USA)

An Efficient Greybox Fuzzing Scheme for Linux-based IoT Programs Through Binary Static Analysis: Yaowen Zheng (School of Cyber Security, University of Chinese Academy of Sciences, P.R. China); Zhanwei Song and Yuyan Sun (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Kai Cheng (School of Cyber Security, University of Chinese Academy of Sciences, P.R. China); Hongsong Zhu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Limin Sun (Institute of Information Engineering, China Academy of Science, Beijing, P.R. China)

***piFogBed: A Fog Computing Testbed Based on Raspberry Pi:** Qiaozhi Xu (Inner Mongolia University and Inner Mongolia Normal University, P.R. China); Junxing Zhang (Inner Mongolia University, P.R. China)

***Mimic: Fast Recovery from Data Corruption Errors in Stencil Computations:** Anis Alazzawe and Krishna Kant (Temple University, USA)

***Integration of Temporal Contextual Information for Robust Energy Disaggregation:** Pascal Alexander Schirmer and Iosif Mporas (University of Hertfordshire, United Kingdom)

Session 5.2: Security - What's Going On?
13:30-15:30 (Christie Room) Chair: Neil Nelson

I Know What You Are Doing with Remote Desktop: Minghao Jiang (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences, P.R. China); Gaopeng Gou and Junzheng Shi (Institute of Information Engineering Chinese Academy of Sciences, P.R. China); Gang Xiong (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

A Method Based on Hierarchical Spatiotemporal Features for Trojan Traffic Detection: Jiang Xie (Chinese Academy of Sciences University, P.R. China); Shuhao Li and Yongzheng Zhang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Xiaochun Yun (National Computer Network Emergency Response Technical Team/Coordination Center of China, P.R. China); Jia Li (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

Side-Channel Information Leakage of Traffic Data in Instant Messaging: Ke Li (University of Chinese Academy of Sciences, School of Cyber Security, P.R. China); Hong Li and Hongsong Zhu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Limin Sun (Institute of Information Engineering, China Academy of Science, Beijing, P.R. China); Hui Wen (Institute of Information Engineering, China Academy of Science, P.R. China)

On Effects of Mobility Management Signalling Based DoS Attacks Against LTE Terminals Chuan Yu and Shuhui Chen (National University of Defense Technology, P.R. China)

Break 15:30 - 16:00

Session 6.1: Edge and Cloud
16:00-18:00 (Gunnell Suite) Chair: Martina Cilia

Cost Efficient Internet Path Tracking Based on Routing Changes Prediction: Yujia Liu (Institute for Network Sciences and Cyberspace, Tsinghua University, P.R. China); Changqing An (Tsinghua University, P.R. China)

Jily: Cost-aware AutoScaling of Heterogeneous GPU for DNN Inference in Public Cloud: Zhaoxing Wang, Xuehai Tang, Qiuyang Liu and Jizhong Han (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

***Rendering Scheduling Framework in Edge Computing: A Congestion Game-based Approach:** Bing Zhou and Hongqi Yang (Sun Yat-sen University, P.R. China)

***F2MC: Enhancing Data Storage Services with Fog-to-MultiCloud Hybrid Computing:** Yinjin Fu and Xiaofeng Qiu (Army Engineering University, P.R. China); Jian Wang (Nanjing University, P.R. China)

***Improving Latency and Jitter Performance in CDMA-based Next-generation Ethernet Passive Optical Networks for 5G Applications:** Elie Naim Inaty (University of Balamand, Lebanon)

Session 6.2: Constructive Security
16:00-18:00 (Christie Room) Chair: Stephan Eidenbenz

A Blockchain-based Authentication Method with One-time Password: Mingli Zhang, Liming Wang and Jing Yang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

VoteGeo: An IoT-based Voting Approach to Verify the Geographic Location of Cloud Hosts: Dongzheng Jia (State Key Laboratory of Information Security, Institute of Information Engineering, CAS, P.R. China); Limin Liu, Shijie Jia and Jingqiang Lin (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

Hiding and Trapping: A Deceptive Approach for Defending Against Network Reconnaissance with Software-Defined Network: Junchi Xing, Mingliang Yang and Haifeng Zhou (Zhejiang University, P.R. China); Chunming Wu (College of Computer Science, Zhejiang University, P.R. China); Wei Ruan (Zhejiang University, P.R. China)

***A Stochastic-based Physical Layer Security in CRNs: Cognitive Relay to Fusion Center:** Oluyomi Simpson and Yichuang Sun (University of Hertfordshire, United Kingdom)

***Placement Optimization of IoT Security Solutions for Edge Computing Based on Graph Theory:** Tanguy Godquin (GREYC and Orange Labs, France); Morgan Barbier (Ecole publique d'Ingénieurs Centre de Recherche - GREYC Labs, France); Chrystel Gaber (Orange Labs, France); Jean-Marie Le Bars (Universite de Caen Basse-Normandie, France); Jean-Luc Grimault (Orange Labs, France)

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IPCCC 2019 Day Three – Thursday, October 31

Registration 08:15-08:30 (Gunnell Suite)

Session 7: Parallel and Distributed Systems

08:30-10:00 (Gunnell Suite) Chair: Ruobing Jiang

Developing the Parallelization Methods for Finding the All-Pairs Shortest Paths in Distributed Memory Architecture: Mohammed Alghamdi, Ligang He, Yujue Zhou and Junyu Li (University of Warwick, United Kingdom)

LT Codes with Feedback: Accelerate the Distributed Matrix-Vector Multiplication with Stragglers: Xiao Yang (Southeast University, P.R. China); Ming Jiang (Southeast University, P.R. China); Chunming Zhao (National Mobile Communications Research Laboratory, Southeast University, P.R. China)

***Intelligent IoT Sensing System Based on Compressive Sensing with Adaptively Learned Dictionary:** Martina Cilia and Keisuke Yamamoto (Hitachi, Ltd., Japan)

***Automatic Data Quality Enhancement with Expert Knowledge for Mobile Crowdsensing:** Jinghan Jiang, Kui Wu and Huan Wang (University of Victoria, Canada); Rong Zheng (McMaster University, Canada)

Break 10:00 - 10:30

Session 8: Machine Learning and Beyond

10:30-12:00 (Gunnell Suite) Chair: Kui Wu

Uncovering Flaming Events on News Media in Social Media: Praboda Rajapaksha (Telecom SudParis and Uva Wellassa University, France); Reza Farahbakhsh (Institut Mines-Telecom, Telecom SudParis, France); Noel Crespi (Institut Mines-Télécom, Télécom SudParis, France); Bruno Defude (Institut Mines-Telecom, Telecom SudParis, France)

Malicious Domain Detection via Domain Relationship and Graph Models: Wenxuan He (University of Chinese Academy of Sciences, P.R. China)

***HS-TCN: A Semi-supervised Hierarchical Stacking Temporal Convolutional Network for Anomaly Detection in IoT:** Yan Xu and Yongliang Cheng (Anhui University, P.R. China); Yi Liu (Peking University Shenzhen Institute, P.R. China); Hong Zhong (School of Computer Science and Technology, Anhui University, P.R. China)

***Typification of Impersonated Accounts on Instagram:** Koosha Zarei (Institut Polytechnique de Paris, Telecom SudParis, France); Reza Farahbakhsh (Institut Mines-Telecom, Telecom SudParis, France); Noel Crespi (Institut Mines-Télécom, Télécom SudParis, France)

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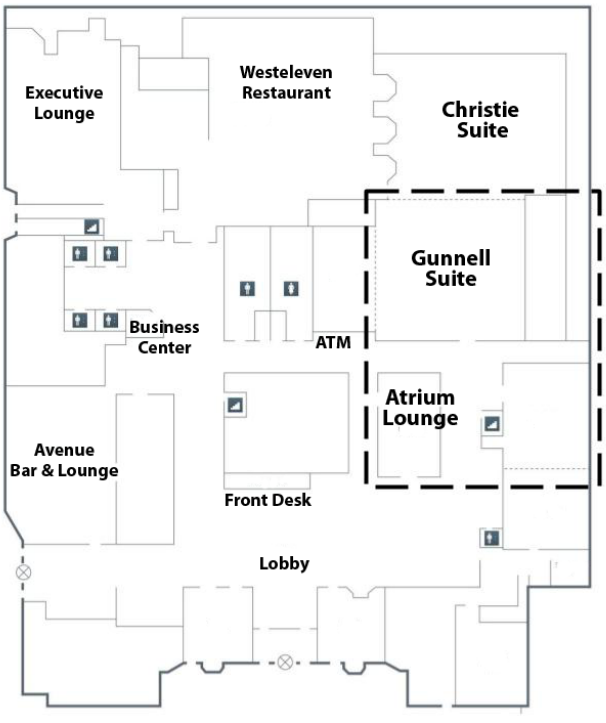

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Keynote Speakers

5G & The Internet of Skills In Action

Prof. Mischa Dohler, Chair Professor, King's College London

Tuesday, October 29, 09:00 (Gunnell Suite)

Abstract:
Today's internet, accessed by fixed and mobile networks, allows us to transmit files, voice and video across the planet. With the emergence of an ultra-responsive and reliable 'Tactile Internet,' advanced techniques in robotics and artificial intelligence, we predict the emergence of an 'Internet of Skills' which allows the transmission of labor globally. It will invoke an important shift from content-delivery to skillset-delivery networks, where engineers would service cars or surgeons performing critical operations anywhere on the planet. For this to work, however, we require some fundamental laws of physics to be "reengineered."

This keynote will discuss the vision, technology and building blocks for said emerging Internet of Skills. I will deep-dive into some of these building blocks, such as 5G and its ability to deliver ultra-low latency networking capabilities as well as open challenges from a compute and networking point of view.

Biography
Mischa Dohler is full Professor in Wireless Communications at King's College London, driving cross-disciplinary research and innovation in technology, sciences and arts. He is a Fellow of the IEEE, the Royal Academy of Engineering, the Royal Society of Arts (RSA), the Institution of Engineering and Technology (IET); and a Ditiguished Member of Harvard SquareLeaders Excellence. He is a serial entrepreneur; composer & pianist with 5 albums on Spotify/iTunes; and fluent in 6 languages. He acts as polcy advisor on issues related to digital, skills and education. He has had ample coverage by national and international press and media.

He is a frequent keynote, panel and tutorial speaker, and has received numerous awards. He has pioneered several research fields, contributed to numerous wireless broadband, IoT/M2M and cyber security standards, holds a dozen patents, organized and chaired numerous conferences, was the Editor-in-Chief of two journals, has more than 200 highly-cited publications, and authored several books.

He was the Director of the Centre for Telecommunications Research at King's from 2014-2018. He is the Cofounder of the Smart Cities pioneering company Worldsensing, where he was the CTO from 2008-2014. He also worked as a Senior Researcher at Orange/France Telecom from 2005-2008.

The Many Layers of Delay Requirements

Prof. Carsten Griwodz, Professor, University of Oslo

Wednesday, October 30, 08:30 (Gunnell Suite)

Abstract:
The term "distributed interactive application" seems old-fashioned today since Cloudification has even turned humble word processing tasks into distributed interactive activities. Consequently, the property of being both interactive and distributed is frequently forgotten to the detriment of end users, who experience a lack of performance. Among gamers, the term "lag" has been coined for this, a catch-all phrase for all problems that end users experience as delay while interacting with an application.

The simplified term can hide excessive round-trip times, but it could also hide bandwidth limitations, processing delays or virtualisation overhead. In fact, any attempt at dealing with delay does first require that we understand the multitude of delays that can affect experience. Applications may be affected negatively by startup delays, rebuffering delays, rendering delays, processing delays, per-byte latency or load finishing time. The relevant kind of delay is application-specific, while the impact on user experience is application- as well as context-specific.

Research and development are continuously working to make improvements to all layers that make up distributed systems. Proposals for new generic architectures or architectural changes, can easily focus on a few of these faces of delay, satisfying a set of applications, while forgetting others that are equally valid.

The keynote attempts to bring structure to the many views on delay. We structure delay demands of applications by the kind of delay that matters to them and provide an insight into user experience studies for several of them. From there, we cast light onto recent and ongoing infrastructure developments, especially at the nework and transport layer, and discuss their potential for fulfilling delay requirements.

Biography
Carsten Griwodz is professor at the University of Oslo and co-founder of ForzaSys AS, a video system startup with a focus on sports.

His research interest is the performance of multimedia systems. His goal is to understand how users can become sufficiently immersed in an experience depending on their goals and context. He explores research advances in fields ranging from operating system and networks to computer vision to understand and reach the point of sufficient immersion.

He received his Diploma in Computer Science from the University of Paderborn, Germany, in 1993. From 1993 to 1997 he worked at the IBM European Networking Center in Heidelberg, Germany. In 1997 he joined the Multimedia Communications Lab at Darmstadt University of Technology, Germany, where he obtained his doctoral degree in 2000. He joined the University of Oslo in 2000. He worked at Simula Research Laboratory from 2005 to 2018. He is member of ACM since 1996 and IEEE since 2011. He is a Mercator Fellow affiliated with the MAKI project at Darmstadt University of Technology.

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