The 17th International Conference on Mobility, Sensing and Networking (MSN 2021)

Online Conference, 13-15 December 2021 (Greenwich Mean Time Zone)

Conference Program and Information Booklet

Sponsored by



13 December 2021 (Monday) Room-3 Room-2 Room-4 8:00-9:40 IDC ECAISS Tutorial-1 9:40-11:00 11:00-12:00 **Virtual Lunch Break** 12:00-13:40 UEIoT NMIC-1 Tutorial-2 13:40-15:00 15:00-15:15 Break 15:15-16:35 AI2OT NMIC-2 Tutorial-3 16:35-18:15 14 December 2021 (Tuesday) Room-2 Room-3 Room-4 MSN-2: Multi-access Edge Computing (I) MSN-3: Deep Reinforcement Learning MSN-1: Federated Learning (I) 8:00-10:00 10:00-10:15 Break MSN-4: Federated Learning (II) MSN-5: Multi-access Edge Computing (II) MSN-6: Network Security (I) 10:15-12:15 Virtual Lunch Break 12:15-13:00 13:00-13:30 **Opening Ceremony (Room-1)** Keynote Speech-1 (Room-1) 13:30-14:30 Keynote Speech-2 (Room-1) 14:30-15:30 15:30-15:45 Break Panel (Room-1) 15:45-17:15 17:15-17:30 Break 17:30-18:10 Poster Session (Room-1) 15 December 2021 (Wednesday) Room-3 Room-2 Room-4 MSN-8: Intelligent Prediction 8:00-10:00 MSN-7: Network Security (II) MSN-9: Human Activity Recognition 10:00-10:15 Break MSN-10: Anomaly Detection 10:15-12:15 MSN-11: Aerial-Satellite Networks MSN-12: Network Traffic 12:15-13:00 Virtual Lunch Break 13:00-15:00 MSN-13: Computer Vision MSN-14: Wireless Sensing MSN-15: Data Privacy 15:00-15:15 Break MSN-17: Resource Management 15:15-17:40 MSN-16: 5G and beyond 17:40-17:50 Closing

Advanced Program Summary (Greenwich Mean Time Zone)

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Keynote Speech 1

IoT Security

Prof. Elisa Bertino

Purdue University, USA

Abstract

The Internet of Things (IoT) paradigm refers to the network of physical objects or "things" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with servers, centralized systems, and/or other connected devices based on a variety of communication infrastructures. IoT makes it possible to sense and control objects creating opportunities for more direct integration between the physical world and computer-based systems. Furthermore, the deployment of AI techniques enhances the autonomy of IoT devices and systems. IoT will thus usher automation in a large number of application domains, ranging from manufacturing and energy management (e.g. SmartGrid), to healthcare management and urban life (e.g. SmartCity). However, because of its fine-grained, continuous and pervasive data acquisition and control capabilities, IoT raises concerns about security, privacy, and safety. Deploying existing solutions to IoT is not straightforward because of device heterogeneity, highly dynamic and possibly unprotected environments, and large scale. In this talk, after outlining key challenges in IoT security and privacy, we outline a security lifecycle approach to securing IoT data, and then focus on our recent work on security analysis for cellular network protocols and edge-based anomaly detection based on machine learning techniques.

Biography



Elisa Bertino is professor of Computer Science at Purdue University. Prior to joining Purdue, she was a professor and department head at the Department of Computer Science and Communication of the University of Milan. She has been a visiting researcher at the IBM Research Laboratory (now Almaden) in San Jose, at the Microelectronics and Computer Technology Corporation, at Rutgers University, and at Telcordia Technologies. Her recent research focuses on digital identity management, biometrics, IoT security, security of 4G and 5G cellular network protocols, and policy infrastructures for managing distributed systems. Prof. Bertino has published more than 700 papers in all major refereed journals, and in proceedings of international conferences and symposia. She has given keynotes, tutorials and invited presentations at conferences and other events. She is a Fellow member of ACM, IEEE, and AAAS. She received the 2002 IEEE Computer Society Technical Achievement Award "For outstanding contributions to database systems and database security and advanced data

management systems", the 2005 IEEE Computer Society Tsutomu Kanai Award for "Pioneering and innovative research contributions to secure distributed systems", and the ACM 2019-2020 Athena Lecturer Award.

Keynote Speech 2

Deep Reinforcement Learning for Control and Management of Communications Networks

Kin K. Leung

EEE and Computing Departments Imperial College, London, UK

Abstract

Deep RL techniques have been applied to many application domains. In communications networks, deep RL has been used to solve routing, service-placement and power-allocation problems in the software defined networks (SDN) as well as the software defined coalitions (SDC) developed in the DAIS ITA Program. This speaker begins with a brief introduction to RL. For illustration purposes, he presents use of RL to train a smart policy for synchronization of domain controllers in order to maximize performance gains in SDN. Results show that the RL policy significantly outperforms other algorithms for inter-domain routing tasks. As shown in the above work, a challenging issue for deep RL is the huge state and action spaces, which increase model complexity and training time beyond practical feasibility. The speaker will present a method to decouple actions from the state space for the value-function learning process and a relatively simple transition model is learned to determine the action that causes the associated state transition. Experimental results show that the state-action separable RL can greatly reduce training time without noticeable performance degradation. The speaker will conclude by highlighting the open issues for use of RL for control of large-scaled communications networks.

Biography



Kin K. Leung received his B.S. degree from the Chinese University of Hong Kong in 1980, and his M.S. and Ph.D. degrees from University of California, Los Angeles, in 1982 and 1985, respectively. He joined AT&T Bell Labs in New Jersey in 1986 and worked at its successor companies until 2004. Since then, he has been the Tanaka Chair Professor in the Electrical and Electronic Engineering (EEE), and Computing Departments at Imperial College in London. He serves as the Head of Communications and Signal Processing Group in the EEE Department at Imperial. His current research focuses on optimization and machine-learning techniques for system design and control of large-scale communication networks and computer infrastructures. He also works on multi-antenna and cross-layer designs for wireless networks. He received the Distinguished Member of Technical Staff Award from AT&T Bell Labs in 1994, and was a co-recipient of the 1997 Lanchester Prize Honorable Mention

Award. He was elected as a Fellow of the IEEE and IET in 2001 and 2021, respectively. He received the Royal Society Wolfson Research Merits Award from 2004 to 2009 and became a member of Academia Europaea in 2012. Jointly with his co-authors, he also received the IEEE ComSoc Leonard G. Abraham Prize (2021) and several best conference paper awards, including at the IEEE PIMRC 2012, ICDCS 2013 and ICC 2019. He serves as a member (2009-11) and the chairman (2012-15) of the IEEE Fellow Evaluation Committee for Communications Society. He was a guest editor for the IEEE JSAC, IEEE Wireless Communications and the MONET journal, and as an editor for the JSAC: Wireless Series, IEEE Transactions on Wireless Communications and IEEE Transactions on Communications. Currently, he chairs the Steering Committee for the IEEE Transactions on Mobile Computing and is an editor for the ACM Computing Survey and International Journal on Sensor Networks.

Session Chair:

MSN-2021 Plenary Panel Session

Digital Twins and their Applications in CPS

Abstract: To be announced

Panel Chair



Wei Zhao Shenzhen Institute of Advanced Technology Chinese Academy of Sciences (CAS) China

Panel Members



Tarek Abdelzaher University of Illinois Urbana-Champaign USA



Jiannong Cao The Hong Kong Polytechnic University Hong Kong



Chenyang Lu Washington University in St. Louis USA



Julie A McCann Imperial College London UK



Raymond Lui Sha University of Illinois Urbana-Champaign USA

Room-2

MSN-2021 Tutorial Session 1

RFID and Backscatter Communications for Motion Capture and Fine Scale Localization

Instructor: Prof. Gregory D. Durgin

Georgia Tech., USA

Abstract

How do you capture the choreography of a ballerina's performance? How does a drone navigate a vast, complex shipping yard to perform inventory? How do you condition a large-aperture antenna so that it is capable of beaming microwave power across long distances in space? In this tutorial, we answer these questions by exploring the emerging world of RFID-based motion capture and fine-scale localization. This tutorial first presents the fundamental barriers that wireless techniques experience in the drive for precise localization. We then survey the available techniques – from basic signal-strength mapping localization using off-the-shelf RFID tags to elegant, quantum-tunneling tags that are used to trace out the echoes of surrounding RF multipath – and quantify/rank performance. RFID and backscatter-based approaches are shown to have the most promise for realizing real-time, motion-capture-grade localization for wireless nodes.

Biography



Prof. Gregory D. Durgin joined the faculty of Georgia Tech's School of Electrical and Computer Engineering in Fall 2003 where he serves as a professor. He received the BSEE (96), MSEE (98), and PhD (00) degrees from Virginia Polytechnic Institute and State University. In 2001 he was awarded the Japanese Society for the Promotion of Science (JSPS) Post-doctoral Fellowship and spent one year as a visiting researcher with Morinaga Laboratory at Osaka University. He has received best paper awards for articles coauthored in the IEEE Transactions on Communications (1998 Stephen O. Rice prize), IEEE Microwave Magazine (2014), and IEEE RFID Conference (2016, 2018, 2019) as well as the 3rd place 2020 Nokia Bell Labs Prize. Prof. Durgin authored Space-Time Wireless Channels (2002), the first textbook in the field of space-time channel modeling which has influenced multiple generations of commercial cellular technologies. Prof. Durgin founded the Propagation Group (http://www.propagation.gatech.edu) at Georgia Tech, a research group that studies radiolocation, channel

sounding, backscatter radio, RFID, and applied electromagnetics. He is a winner of the NSF CAREER award as well as numerous teaching awards, including the Class of 1940 Howard Ector Outstanding Classroom Teacher Award at Georgia Tech (2007). He has served on the editorial staff for IEEE RFID Virtual Journal, IEEE Transactions on Wireless Communications, and IEEE Journal on RFID. He also serves as Vice-President of Conferences for the IEEE Council of RFID. He is a frequent consultant to industry, having advised many multinational corporations on wireless technology.

MSN-2021 Tutorial Session 2

Room-2

Federated Analytics: A New Collaborative Computing Paradigm towards Privacy focusing World

Instructor: Prof. Dan Wang, Ms. Siping Shi

The Hong Kong Polytechnic University

Abstract

In this tutorial, we present federated analytics, a new distributed computing paradigm for data analytics applications with privacy concerns. Today's edge-side applications generate massive data. In many applications, the edge devices and the data belong to diverse owners; thus data privacy has become a concern to these owners. Federated analytics is a newly proposed computing paradigm where raw data are kept local with local analytics and only the insights generated from local analytics are sent to a server for result aggregation. It differs from the federated learning paradigm in the sense that federated learning emphasizes on collaborative model training, whereas federated analytics emphasizes on drawing conclusions from data. This tutorial will be divided into three parts. First, we will present the definition, taxonomy, application cases and architecture of the federated analytics paradigm. In particular, we present a federated video analytics framework which can be used for HD map construction using social vehicles with privacy concerns. Second, we will present federated anomaly analytics to address the local model poisoning attack in current federated learning systems. Third, we will present federated skewness analytics to address the data skewness problem in current federated learning systems.

Biography



Prof. Dan Wang' research falls in general computer networking and systems, where he published in ACM SIGCOMM, ACM SIGMETRICS and IEEE INFOCOM, and many others. He is the steering committee chair of IEEE/ACM IWQoS. He served as the TPC co-Chair of IEEE/ACM IWQoS 2020. His recent research focus on smart energy systems. He won the Best Paper Awards of ACM e-Energy 2018 and ACM Buildsys 2018. He has served as a TPC co-Chair of the ACM e-Energy 2020 and he will serve as General co-Chair of the ACM e-Energy 2022. He is a steering committee member of ACM e-Energy. His research has been adopted by industry, e.g., Henderson, Huawei, and IBM. He won the Global Innovation Award, TechConnect, in 2017. He got his B.Sc., M.Sc., Ph.D. from Peking University, Case Western reserve University and Simon Fraser University, all in Computer Science.



Siping Shi received her B.S. degree in computer science from Sichuan University in 2014, and her M.S. degree in computer applied technology from the University of Chinese Academy of Sciences in 2017. She is currently a Ph.D. candidate at The Hong Kong Polytechnic University. Her research interests include edge computing, federated learning and analytics.

Session Chair:

MSN-2021 Tutorial Session 3

Machine Learning Security and Privacy in Networking

Instructor: Prof. Yanjiao Chen

Zhejiang University, China

Abstract

Machine learning has gradually found its way into the networking area. Unfortunately, the vulnerability of machine learning models also infects the networking domain, raising alarming issues that may threaten the privacy and security of critical applications. In this tutorial, I will give a systematic introduction of typical attacks against machine learning models, including adversarial attacks, backdoor attacks, membership inference attacks, model extraction attacks, model inversion attacks and so on. The tutorial will cover a series of works on applying modern machine learning to networking and analyze the potential risk of current architectures of machine learning models and its impact on networking applications.

Biography



Prof. Yanjiao Chen received her B.E. degree in Electronic Engineering from Tsinghua University in 2010 and Ph.D. degree in Computer Science and Engineering from Hong Kong University of Science and Technology in 2015. She is currently a Bairen Researcher in the College of Electrical Engineering, Zhejiang University, China. Her research interests include ML security, AI in networking, and mobile sensing. Yanjiao has published papers in ACM CCS, IEEE INFOCOM, ICDCS, etc. Yanjiao has served on the editorial board of IEEE WCL and served as TPC member in IEEE INFOCOM, NDSS, ICNP, etc.

Technical Program (Time zone: GMT/UTC)

Monday, 13 December 2021

Monday, 13 December 2021 | 08:00 – 09:40 (London Time) Monday, 13 December 2021 | 16:00 – 17:40 (Beijing Time) Monday, 13 December 2021 | 03:00 – 04:40 (New York Time)

1st International Workshop on Intelligent Data Collection in Cyber-Physical Systems (IDC)

<u>Session 1 (8:00 – 10:40)</u> Session Chair: Weiping Zhu (Wuhan University, China) Junbin Liang (Guangxi University, China) Xuefeng Liu (Beihang University, China)

2prong: Adaptive Video Streaming with DNN and MPC

Yipeng Wang, Tongqing Zhou, Zhiping Cai (National University of Defense Technology, China)

FDataCollector: A Blockchain Based Friendly Web Data Collection System

Jing Wang, Weiping Zhu, Jianqiao Lai, Zhu Wang (Wuhan University, China)

Mobile Unattended-Operation Detector for Bulk Dangerous Goods Handling Nicola Zingirian (University of Padova, Italy), Federico Botti (Click & Find s.r.l, Italy)

The Design and Implementation of an Efficient Quaternary Network Flow Watermark Technology Lusha Mo, Gaofeng Lv, Baosheng Wang, Guanjie Qiao, Jing Tan (National University of Defense Technology, China)

TSCF: An Efficient Two-Stage Cuckoo Filter for Data Deduplication

Tao Liu (Peking University, China), Qinshu Chen (Guangdong Communications & Networks Institute, China), Hui Li, Bohui Wang, Xin Yang (Peking University, China)

Monday, 13 December 2021 | 12:00 – 14:20 (London Time) Monday, 13 December 2021 | 20:00 – 22:20 (Beijing Time) Monday, 13 December 2021 | 07:00 – 09:20 (New York Time)

2nd International Workshop on Ubiquitous Electric Internet of Things (UEIoT)

Session 1 (12:00 - 14:20)

Session Chair: Ying Ma (Xiamen University of Technology, China)

A Secure and High Concurrency SM2 Cooperative Signature Algorithm For Mobile Network Wenfei Qian, Pingjian Wang, Lingguang Lei, Tianyu Chen, Bikuan Zhang (State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences, China)

On Firefly Synchronization of Sleep Phases in Energy Efficient Meshed Networks Guido Dietl (Landshut University of Applied Sciences, Germany)

Power information integrated display system based on interconnection technology Xiazhe Tu, Chao Xun, Xiangyu Wu, Jinbo Li, Lingyi Yang (Economic and Technological Research Institute State Grid Fujian Electric Power Co., Ltd, China)

Research and Application of Intelligent Distribution Network Planning for Multi-source Data Fusion

Zhe Wang, Hongda Zhao, Mingxia Zhu (Economic and Technological Research Institute of State Grid Jiangsu Electric Power Co., Ltd, China)

Research on Visual Engine of Smart Planning System Based on Internet of Things

Hongda Zhao, Mingxia Zhu, Zhe Wang (Economic and Technological Research Institute of State Grid Jiangsu Electric Power Co., Ltd, China)

Monday, 13 December 2021 | 15:15 – 16:35 (London Time) Monday, 13 December 2021 | 23:15 – 00:35 (+1) (Beijing Time) Monday, 13 December 2021 | 10:15 – 11:35 (New York Time)

3rd International Workshop on Artificial Intelligence Applications in Internet of Things (AI2OT)

Session 1 (15:15 - 17:15)

Session Chair: Xuan Liu (Hunan University, Changsha, China) Yanchao Zhao (Nanjing University of Aeronautics and Astronautics Nanjing, China)

Eaxming and Evaluating Dimension Reduction Algorithms for Classifying Alzheimer's Diseases using Gene Expression Data

Shunbao Li, Po Yang, Vitaveska Lanfranchi (University of Sheffield, UK), Alzheimer's Disease Neuroimaging Initiative

LSTM for Periodic Broadcasting in Green IoT Applications over Energy Harvesting Enabled Wireless Networks: Case Study on ADAPCAST

Mustapha Khiati (USTHB, Algeria), Djamel Djenouri (University of the West of England - UWE Bristol, UK), Jianguo Ding (University of Skovde, Sweden), Youcef Djenouri (SINTEF Digital, Norway)

MsfNet: a novel small object detection based on multi-scale feature fusion

Ziying Song (Hebei University of Science and Technology, China), Peiliang Wu (Yanshan University, China), Kuihe Yang, Yu Zhang, Yi Liu (Hebei University of Science and Technology, China)

Under-determined Blind Speech Separation via the Convolutive Transfer Function and Lp Regularization

Liu Yang (Guangzhou University, China), Yang Junjie (Guangdong University ot Technology, China), Yi Guo (Western Sydney University, Australia)

Monday, 13 December 2021 | 08:00 – 09:20 (London Time) Monday, 13 December 2021 | 16:00 – 17:20 (Beijing Time) Monday, 13 December 2021 | 03:00 – 04:20 (New York Time)

3rd International Workshop on Edge Computing and Artificial Intelligence based Sensor-Cloud System (ECAISS)

<u>Session 1 (08:00 – 10:40)</u> Session Chair: Chi Lin (Dalian University of Technology, China) Pengfei Wang (Dalian University of Technology, China)

Continus Finger Tracking System based on Inertial Sensor Yangyang Fang, Qun Fang, Xin He (Anhui Normal University, China)

Sequence-based Indoor Relocalization for Mobile Augmented Reality

Kun Wang (Liaoning Police College, China), Jiaxing Che (Beihang University, China), Zhejun Shen (UnionSys Technology Co. Ltd, China)

Toward Dispersed Computing: Cases and State-of-The-Art

Sen Yuan, Geming Xia, Jian Chen, Chaodong Yu (National University of Defense Technology, China)

Trust Evaluation of Computing Power Network Based on Improved Particle Swarm Neural Network

Chaodong Yu, Geming Xia, Zhaohang Wang (National University of Defense Technology, China)

Monday, 13 December 2021 | 12:00 – 13:40 & 15:15 – 16:35 (London Time) Monday, 13 December 2021 | 20:00 – 21:40 & 23:15 – 00:35 (+1) (Beijing Time) Monday, 13 December 2021 | 07:00 – 08:40 & 10:15 – 11:35 (New York Time)

3rd International Workshop on Network Meets Intelligent Computations (NMIC)

<u>Session 1 (12:00 – 13:40)</u>

Session Chair: Lei Yang (South China University of Technology, China)

A DDoS protection method based on traffic scheduling and scrubbing in SDN Yiwei Yu, Guang Cheng, Zihan Chen, Haoxuan Ding (Southeast University, China)

Adaptive Distributed Beacon Congestion Control with MachineLearning in VANETs

Mahboubeh Mohammadi (Iran University of Science and Technology, Iran), Ali Balador (RISE Research Institute of Sweden, Sweden), Zaloa Fernandez (Vicomtech Foundation, Basque Research and Technology Alliance (BRTA), Spain), Iñaki Val (Ikerlan Technology Research Centre, Spain)

AND: Effective Coupling of Accuracy, Novelty and Diversity in the Recommender System

Di Han (Guangdong University of Finance, China), Yifan Huang, Xiaotian Jing, Junmin Liu (Xi'an Jiaotong University, China)

Attention-based Bicomponent Synchronous Graph Convolutional Network for traffic flow prediction

Cheng Shen, Kai Han, Tianyuan Bi (University of Science and Technology of China, China)

Intelligent IDS Chaining for Network Attack Mitigation in SDN

Mikhail Zolotukhin, Pyry Kotilainen, Timo Hämäläinen (University of Jyväskylä, Finland)

Session 2 (15:15 - 17:15)

Session Chair: Wei Cai (The Chinese University of Hong Kong, Shenzhen, China)

Interference and Consultation in Virtual Public Space: The Practice of Intermedia Art in Metaverse

Rongman Hong (Guangzhou Academy of Fine Arts, China), Hao He (The Chinese University of Hong Kong, Shenzhen, China)

Large-Area Human Behavior Recognition withCommercial Wi-Fi Devices

Tao Liu (The University of Aizu, Japan), Shengli Pan (Beijing University of Posts and Telecommunications, China), Peng Li (The University of Aizu, Japan)

Reliable Routing and Scheduling in Time-Sensitive Networks

Hongtao Li, Hao Cheng, Lei Yang (South China University of Technology, China)

Seshat: Decentralizing Oral History Text Analysis

Lin Wang (Guangzhou Academy of Fine Arts, China), Lehao Lin (The Chinese University of Hong Kong, Shenzhen, China), Xiao Wu (White Matrix Inc., China), Rongman Hong (Guangzhou Academy of Fine Arts, China)

Main Conference Day 1 (Time zone: GMT/UTC)

Tuesday, 14 December 2021

Tuesday, 14 December 2021 | 08:00 – 10:00 (London Time) Tuesday, 14 December 2021 | 16:00 – 18:00 (Beijing Time) Tuesday, 14 December 2021 | 03:00 – 05:00 (New York Time)

Session MSN-1: Federated Learning (I) (Room 2, 8:00 – 10:00)

Session Chair: Bryan Wei Yang Lim (Alibaba-NTU Singapore Joint Research Institute, Singapore)

A Hierarchical Incentive Mechanism for Coded Federated Learning

Jer Shyuan Ng, Wei Yang Bryan Lim (Alibaba-NTU JRI, Singapore), Zehui Xiong (Singapore University of Technology Design, Singapore), Xianjun Deng (Huazhong University of Science and Technology, China), Yang Zhang (Nanjing University of Aeronautics and Astronautics, China), Dusit Niyato, Cyril Leung (Nanyang Technological University, Singapore)

Communication-efficient Subspace Methods for High-dimensional Federated Learning Zai Shi, Atilla Eryilmaz (The Ohio State University, USA)

Defending against Membership Inference Attacks in Federated learning via Adversarial Example Yuanyuan Xie, Bing Chen (Nanjing University of Aeronautics and Astronautics, China), Jiale Zhang (Yangzhou University, China), Di Wu (Deakin University, Melbourne, Australia)

Defending Against Byzantine Attacks in Quantum Federated Learning

Qi Xia, Zeyi Tao, Qun Li (College of William and Mary, USA)

DeSMP: Differential Privacy-exploited Stealthy Model Poisoning Attacks in Federated Learning Md Tamjid Hossain, Shafkat Islam, Shahriar Badsha, Haoting Shen (University of Nevada, Reno, USA)

Tuesday, 14 December 2021 | 08:00 – 10:00 (London Time) Tuesday, 14 December 2021 | 16:00 – 18:00 (Beijing Time) Tuesday, 14 December 2021 | 03:00 – 05:00 (New York Time)

Session MSN-2: Multi-access Edge Computing (I) (Room 3, 08:00-10:00) Session Chair: Jiachen Shen (East China Normal University, China)

Caching, Recommendations and Opportunistic Offloading at the Network Edge

Margarita Vitoropoulou, Konstantinos Tsitseklis (National Technical University of Athens, Greece), Vasileios Karyotis (Ionian University, Greece), Symeon Papavassiliou (National Technical University of Athens, Greece)

CRATES : A Cache Replacement Algorithm for Access Frequency-Low Period in Edge Server

Pengmiao Li, Yuchao Zhang, Huahai Zhang, Wendong Wang (Beijing University of Posts and Telecommunications, China), Ke Xu (Tsinghua University, China), Zhili Zhang (University of Minnesota, USA)

Evaluating Multimedia Protocols on 5G Edge for Mobile Augmented Reality

Jacky Cao (University of Oulu, Finland), Xiang Su (Norwegian University of Science and Technology, Norway), Benjamin Finley (University of Helsinki, Finland), Antti Pauanne (University of Oulu, Finland), Mostafa Ammar (Georgia Institute of Technology, USA), Pan Hui (University of Helsinki, Finland)

Gaming at the Edge: A Weighted Congestion Game Approach for Latency-Sensitive Scheduling

Xuezheng Liu, Ke Liu (Sun Yat-Sen University, China), Guoqiao Ye (Tencent Technology Co. Ltd, China), Miao Hu (Sun Yat-Sen University, China), Yipeng Zhou (Macquarie University, Australia), Di Wu (Sun Yat-Sen University, China)

Mobility-Aware Efficient Task Offloading with Dependency Guarantee in Mobile Edge Computing Networks

Tuesday, 14 December 2021 | 08:00 – 10:00 (London Time) Tuesday, 14 December 2021 | 16:00 – 18:00 (Beijing Time) Tuesday, 14 December 2021 | 03:00 – 05:00 (New York Time)

<u>Session MSN-3: Deep Reinforcement Learning (Room 4, 8:00 – 10:00)</u> Session Chair: Bingyang Li (Chinese Academy of Sciences, China)

A Scheduling Scheme in a Container-based Edge Computing Environment Using Deep Reinforcement Learning Approach Tingting Lu, Fanping Zeng, Jingfei Shen, Guozhu Chen, Wenjuan Shu, Weikang Zhang (University of Science and Technology of China, China)

Deep Reinforcement Learning-Based Edge Caching and Multi-link Cooperative Communication in Internet-of-Vehicles Teng Ma, Xin Chen, Libo Jiao, Ying Chen (Beijing Information Science and Technology University, China)

Distributed Task Offloading based on Multi-Agent Deep Reinforcement Learning Shucheng Hu, Tao Ren, Jianwei Niu (University of Göttingen, Germany), Zheyuan Hu (Zhengzhou University, China), Guoliang Xing (The Chinese University of Hong Kong, Hong Kong)

Wireless Network Abnormal Traffic Detection Method Based on Deep Transfer Reinforcement Learning Yuanjun Xia, Shi Dong (Wuhan Textile University, China)

Neural Adaptive IoT Streaming Analytics with RL-Adapt Bonan Shen, Chenhong Cao, Tong Liu, Jiangtao Li, Yufeng Li (Shanghai University, China)

Tuesday, 14 December 2021 | 10:15 - 12:15 (London Time) Tuesday, 14 December 2021 | 18:15 - 20:15 (Beijing Time) Tuesday, 14 December 2021 | 05:15 - 07:15 (New York Time)

<u>Session MSN-4: Federated Learning (II) (Room 2, 10:15-12:15)</u> Session Chair: Yanjiao Chen (Zhejiang University, China)

Efficient Privacy-Preserving Federated Learning for Resource-Constrained Edge Devices Jindi Wu, Qi Xia, Qun Li (College of William & Mary, USA)

FedHe: Heterogeneous Models and Communication-Efficient Federated Learning Yun Hin Chan, Edith C.H. Ngai (The University of Hong Kong, Hong Kong)

FIDS: A Federated Intrusion Detection System for 5G Smart Metering Network

Parya Haji Mirzaee, Mohammad Shojafar, Zahra Pooranian (University of Surrey, UK), Pedram Asef (University of Hertfordshire, UK), Haitham Cruickshank, Rahim Tafazolli (University of Surrey, UK)

FNEL:An Evolving Intrusion Detection System Based on Federated Never-Ending Learning Tian Qin, Guang Cheng, Wenchao Chen, Xuan Lei (Southeast University, China)

Unsupervised Federated Adversarial Domain Adaptation for Heterogeneous Internet of Things Jinfeng Ma, Mengxuan Du, Haifeng Zheng, Xinxin Feng (Fuzhou University, China)

Tuesday, 14 December 2021 | 10:15 - 12:15 (London Time) Tuesday, 14 December 2021 | 18:15 - 20:15 (Beijing Time) Tuesday, 14 December 2021 | 05:15 - 07:15 (New York Time)

<u>Session MSN-5: Multi-access Edge Computing (II) (Room 3, 10:15-12:15)</u> Session Chair: Tutomu Murase (Nagoya University, Japan)

Towards High Accuracy Low Latency Real-Time Road Information Collection: An Edge-Assisted Sensor Fusion Approach

You Luo (Simon Fraser University, Canada), Feng Wang (The University of Mississippi, USA), Jiangchuan Liu (Simon Fraser University, Canada)

A Novel Deployment Method for UAV-mounted Mobile Base Stations

Di Wu, Juan Xu, Jiabin Yuan, Xiangping Zhai (Nanjing University of Aeronautics and Astronautics, China)

Joint Task Offloading and Resource Allocation for MEC Networks Considering UAV Trajectory

Xiyu Chen, Yangzhe Liao, Qingsong Ai (Wuhan University of Technology, China)

User Cooperative Mobility for Higher QoS in Ad Hoc Network: Framework and Evaluation Tutomu Murase (Nagoya University, Japan)

Tutoniu Murase (Nagoya Oniversity, Japan)

Design and Implementation of a RISC V Processor on FPGA Ludovico Poli, Sangeet Saha, Xiaojun Zhai, Klaus Mcdonald-Maier (University of Essex, UK)

Tuesday, 14 December 2021 | 10:15 - 12:15 (London Time) Tuesday, 14 December 2021 | 18:15 - 20:15 (Beijing Time) Tuesday, 14 December 2021 | 05:15 - 07:15 (New York Time)

Session MSN-6: Network Security (I) (Room 4, 10:15-12:15)

Session Chair: Jianan Hong (Shanghai Jiaotong University, China)

BALSAPro: Towards A Security Protocol for Bluetooth Low Energy

Mohamad Muwfak Hlal, Weizhi Meng (Technical University of Denmark, Denmark)

Impact of UAV Mobility on Physical Layer Security

Rukhsana Ruby, Basem M. Elhalawany, Kaishun Wu (Shenzhen University, China)

Network Security by Merging two Robust Tools from the Mathematical Firmament

Andreas Andreou (University of Nicosia Research Foundation (UNRF), Cyprus), Constandinos Mavromoustakis (University of Nicosia, Cyprus), George Mastorakis (Hellenic Mediterranean University, Greece), Jordi Mongay Batalla (Warsaw University of Technology and National Institute of Telecommunications, Poland)

Leveraging blockchain for cross-institution data sharing and authentication in mobile healthcare Le Lai, Tongqing Zhou, Zhiping Cai, Jiaping Yu, Hao Bai (National University of Defense Technology, China)

Performance Comparison of Hybrid Encryption-based Access Control Schemes in NDN

Htet Htet Hlaing, Yuki Funamoto, Masahiro Mambo (Kanazawa University, Japan)

Tuesday, 14 December 2021 | 13:00 - 13:30 (London Time) Tuesday, 14 December 2021 | 21:00 - 21:30 (Beijing Time) Tuesday, 14 December 2021 | 08:00 - 08:30 (New York Time) Opening Ceremony

Tuesday, 14 December 2021 | 13:30 - 14:30 (London Time) Tuesday, 14 December 2021 | 21:30 - 22:30 (Beijing Time) Tuesday, 14 December 2021 | 08:30 - 09:30 (New York Time) Keynote Speech 1: IoT Security - Prof. Elisa Bertino, Purdue University, USA Session Chair: Xiaohua Jia (City University of Hong Kong, Hong Kong)

Tuesday, 14 December 2021 | 14:30 - 15:30 (London Time) Tuesday, 14 December 2021 | 22:30 - 23:30 (Beijing Time) Tuesday, 14 December 2021 | 09:30 - 10:30 (New York Time) Keynote Speech 2: Deep Reinforcement Learning for Control and Management of Communications Networks - Prof. Kin K. Leung, Imperial College, London, UK Session Chair: Jia Hu (University of Exeter, U. K.)

Tuesday, 14 December 2021 | 15:45 - 17:15 (London Time) Tuesday, 14 December 2021 | 23:45 - 01:15(+1) (Beijing Time) Tuesday, 14 December 2021 | 10:45 - 12:15 (New York Time) Panel:

Topic: Digital Twins and their Applications in CPS

Panel Chair: Wei Zhao (Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China) Panel Members:

- Tarek Abdelzaher, University of Illinois Urbana-Champaign, USA
- Jiannong Cao, The Hong Kong Polytechnic University, Hong Kong
- Chenyang Lu, Washington University in St. Louis, USA
- Julie A McCann, Imperial College London, UK
- Raymond Lui Sha, University of Illinois Urbana-Champaign, USA

Tuesday, 14 December 2021 | 17:30 - 18:10 (London Time) Tuesday, 14 December 2021 | 01:30 - 02:10(+1) (Beijing Time) Tuesday, 14 December 2021 | 12:30 - 13:10 (New York Time)

Session Poster (Room 1, 17:30-18:10)

Session Chair: Wei Wang (San Diego State University, USA)

Indoor Navigation for Users with Mobility Aids Using Smartphones and Neighborhood Networks

Bo Hui, Chen Jiang, Pavani Ankireddy (Auburn University, USA), Wenlu Wang (Texas A&M University-Corpus Christi (TAMUCC), USA), Wei-Shinn Ku (Auburn University, USA)

Demonstrator Game Showcasing Indoor Positioning via BLE Signal Strength

Felix Beierle (University of Würzburg, Germany), Hai Dinh-Tuan, Yong Wu (Technische Universität Berlin, Germany)

Optimizing microservices with hyperparameter optimization

Hai Dinh-Tuan, Katerina Katsarou, Patrick Herbke (Technische Universität Berlin, China)

L-KPCA: an efficient feature extraction method for network intrusion detection

Jinfu Chen, Shang Yin, Saihua Cai, Lingling Zhao, Shengran Wang (Jiangsu University, China)

Main Conference Day 2 (*Time zone: GMT/UTC*)

Wednesday, 15 December 2021

Wednesday, 15 December 2021 | 08:00 - 10:00 (London Time) Wednesday, 15 December 2021 | 16:00 - 18:00 (Beijing Time) Wednesday, 15 December 2021 | 03:00 - 05:00 (New York Time)

<u>Session MSN-7: Network Security (II) (Room 2, 8:00 – 10:00)</u> Session Chair: Kaiping Xue (University of Science and Technology of China, China)

Publish or Perish: Defending Withholding Attack in Dfinity Consensus

Hanzheng Lyu, Jianyu Niu, Fangyu Gai, Chen Feng (University of British Columbia (Okanagan Campus), Canada)

Method for Detecting and Analyzing the Compromising Emanations of USB Storage Devices

Bo Liu (Institute of Information Engineering, CAS and University of Chinese Academy of Sciences, China), Yanyun Xu, Weiqing Huang (Institute of Information Engineering, Chinese Academy of Sciences (CAS), China), Shaoying Guo (Institute of Information Engineering, CAS and University of Chinese Academy of Sciences, China)

Deep Learning for Cyber Deception in Wireless Networks

Felix Olowononi (Howard University, USA), Ahmed H. Anwar (US Army Research Lab, USA), Danda Rawat (Howard University, USA), Jaime Acosta, Charles Kamhoua (US Army Research Lab, USA)

Website Fingerprinting on Access network and Core Gateway

Hantao Mei, Guang Cheng, Wei Gao, Junqiang Chen (Southeast University, China)

TAP: A Traffic-Aware Probabilistic Packet Markingfor Collaborative DDoS Mitigation

Liu Mingxing, Liu Ying, Xu Ke, He Lin, Wang Xiaoliang, Guo Yangfei (Tsinghua University, China), Jiang Weiyu (Huawei Technologies, China)

Wednesday, 15 December 2021 | 08:00 - 10:00 (London Time) Wednesday, 15 December 2021 | 16:00 - 18:00 (Beijing Time) Wednesday, 15 December 2021 | 03:00 - 05:00 (New York Time)

Session MSN-8: Intelligent Prediction (Room 3, 8:00 – 10:00)

Session Chair: Andreas Andreou (University of Nicosia Research Foundation, Cyprus)

IDS: An Intelligent Data Semantics System for Communication Link Prediction in SIoT

Bo Wang, Zunfu Huang, Meixian Song (Tianjin University, China), Qinxue Jiang (Newcastle University, China), Naixue Xiong (Northeastern State University, USA)

Multi-Source Date-Driven Route Prediction for Instant Delivery

Zhiyuan Zhou (Southeast University, China), Xiaolei Zhou (National University of Defense Technology, China), Yao Lu, Hua Yan, Baoshen Guo, Shuai Wang (Southeast University, China)

Resource Demand Prediction of Cloud Workloads Using an Attention-based GRU Model

Wenjuan Shu, Fanping Zeng (University of Science and Technology of China, China), Zhen Ling (Southeast University, China), Junyi Liu, Tingting Lu, Guozhu Chen (University of Science and Technology of China, China)

Soft Actor-Critic Algorithm for 360-Degree VideoStreaming with Long-Term Viewport Prediction

Xiaosong Gao, Jiaxin Zeng, Xiaobo Zhou, Tie Qiu, Keqiu Li (Tianjin University, China)

Matching Theory Aided Federated Learning Method for Load Forecasting of Virtual Power Plant

Min Yan, Li Wang (Beijing University of Posts and Telecommunications, China), Xuanyuan Wang (State Grid Jibei Electric Power Company Ltd., China), Liang Li, Lianming Xu, Aiguo Fei (Beijing University of Posts and Telecommunications, China)

Wednesday, 15 December 2021 | 16:00 - 18:00 (Beijing Time) Wednesday, 15 December 2021 | 03:00 - 05:00 (New York Time)

Session MSN-9: Human Activity Recognition (Room 4, 8:00 – 10:00)

Session Chair: Zhihong Sun (Wuhan University, China)

An Improved Online Multiple Pedestrian Tracking Based on Head and Body Detection

Zhihong Sun, Jun Chen (Wuhan University, China), Mithun Mukherjee (Nanjing University of Information Science and Technology, China), Haihui Wang (Wuhan Institute of Technology, China), Dan Zhang (Wuhan University, China)

Activity Selection to Distinguish Healthy People from Parkinson's Disease Patients Using I-DA

Liu Tao (Yunnan University, China), Po Yang (University of Sheffield, UK)

IMFi: IMU-WiFi based Cross-modal Gait Recognition System with Hot-Deployment Zengyu Song, Hao Zhou, Shan Wang, Jinmeng Fan, Kaiwen Guo, Wangqiu Zhou (University of Science and Technology of China, China), Xiaoyan Wang (Ibaraki University, Japan), Xiang-Yang Li (University of Science and Technology of China, China)

Modeling Disease Progression Flexibly with Nonlinear Disease Structure via Multi-task Learning Menghui Zhou (Yunnan University, China), Po Yang (University of Sheffield, UK)

Friendship Understanding by Smartphone-based Interactions: A Cross-space Perspective

Liang Wang, Haixing Xu, Zhiwen Yu (Northwestern Polytechnical University, China), Rujun Guan (Xi'an University of Science and Technology, China), Bin Guo, Zhuo Sun (Northwestern Polytechnical University, China)

Wednesday, 15 December 2021 | 10:15 - 12:15 (London Time) Wednesday, 15 December 2021 | 18:15 - 20:15 (Beijing Time) Wednesday, 15 December 2021 | 05:15 - 07:15 (New York Time)

Session MSN-10: Anomaly Detection (Room 2, 10:15-12:15)

Session Chair: Weizhi Meng (Technical University of Denmark, Denmark)

AWGAN: Unsupervised Spectrum Anomaly Detection with Wasserstein Generative Adversarial Network along with Random Reverse Mapping

Weiqing Huang, Bingyang Li, Wen Wang, Meng Zhang, Sixue Lu, Yushan Han (Institute of Information Engineering, Chinese Academy of Sciences (CAS), China)

One-Class Support Vector Machine with Particle Swarm Optimization for Geo-Acoustic Anomaly Detection

Dan Zhang, Zhihong Sun (Wuhan University, China), Mithun Mukherjee (Nanjing University of Information Science and Technology, China)

ReDetect: Reentrancy Vulnerability Detection in Smart Contracts with High Accuracy

Rutao Yu (Harbin Institute of Technology, Shenzhen, China), Jiangang Shu (Peng Cheng Laboratory, China), Dekai Yan (Harbin Institute of Technology, Shenzhen, China), Xiaohua Jia (Harbin Institute of Technology, Shenzhen, China and City University of Hong Kong, Hong Kong)

TraceModel: An Automatic Anomaly Detection and Root Cause Localization Framework for Microservice Systems

Yang Cai, Biao Han, Jinshu Su (National University of Defense Technology, China), Xiaoyan Wang (Ibaraki University, Japan)

Towards Heap-Based Memory Corruption Discovery

Wenzhi Wang, Meng Fan (Institute of Information Engineering, Chinese Academy of Sciences (CAS) and University of Chinese Academy of Sciences, China), Aimin Yu, Dan Meng (Institute of Information Engineering, Chinese Academy of Sciences (CAS), China)

Wednesday, 15 December 2021 | 10:15 - 11:55 (London Time) Wednesday, 15 December 2021 | 18:15 - 19:55 (Beijing Time)

Session MSN-11: Aerial-Satellite Networks (Room 3, 10:15-11:55) Session Chair: Wenjun Yang (University of Victoria, Canada)

Reinforcement Learning based Scheduling for Heterogeneous UAV Networking

Jian Wang (Embry-Riddle Aeronautical University, USA), Yongxin Liu (Auburn University at Montgomery, USA), Shuteng Niu (Bowling Green State University, USA), Houbing Song (Embry-Riddle Aeronautical University, USA)

MM-QUIC: A mobility-aware multipath QUIC for satellite networks

Lin Cai, Wenjun Yang, Shengjie Shu, Jianping Pan (University of Victoria, Canada)

Time-varying Contact Management with Dynamic Programming for LEO Satellite Networks

Feng Wang, Dingde Jiang (University of Electronic Science and Technology of China, China), Yingjie Chen (Qingdao University, China), Houbing Song (Embry-Riddle Aeronautical University (ERAU), USA), Zhihan Lv (Qingdao University, China)

A Large Inter-Satellite Non-dependent Routing Technology — IS-OLSR

Dongkun Huo, Qiang Liu, Yantao Sun, Huiling Li (Beijing Jiaotong University, China)

Wednesday, 15 December 2021 | 10:15 - 12:15 (London Time) Wednesday, 15 December 2021 | 18:15 - 20:15 (Beijing Time) Wednesday, 15 December 2021 | 05:15 - 07:15 (New York Time)

Session MSN-12: Network Traffic (Room 4, 10:15-12:15)

Session Chair: Pablo Casaseca (University of Valladolid, Spain)

Flow Transformer: A Novel Anonymity Network Traffic Classifier with Attention Mechanism

Ruijie Zhao, Yiteng Huang, Xianwen Deng, Zhi Xue, Jiabin Li (Shanghai Jiao Tong University, China), Zijing Huang (Fudan University, China), Yijun Wang (Shanghai Jiao Tong University, China)

FlowFormers: Transformer-based Models for Real-time Network Flow Classification

Rushi Babariya (BITS Pilani, India), Sharat Chandra Madanapalli (UNSW Sydney, Canopus Networks, Australia), Himal Kumar (Canopus Networks, Australia), Vijay Sivaraman (UNSW Sydney, Australia)

A Clustering Method of Encrypted Video Traffic Based on Levenshtein Distance

Luming Yang, Shaojing Fu, Yuchuan Luo (National University of Defense Technology, China)

DVC:An Deductable Video Coding for Video Broadcast in Highly Dynamic Networks

Yunhuai Liu, Yonggui Huang, Sheng Gu (Peking University, China)

Mining Centralization of Internet Service Infrastructure in the Wild

Bingyang Guo, Fan Shi, Chengxi Xu, Min Zhang, Yang Li (National University of Defense Technology, China)

Wednesday, 15 December 2021 | 13:00 - 15:00 (London Time) Wednesday, 15 December 2021 | 21:00 - 23:00 (Beijing Time) Wednesday, 15 December 2021 | 08:00 - 10:00 (New York Time)

Session MSN-13: Computer Vision (Room 2, 13:00-15:00) Session Chair: Zhenming Liu (College of William and Mary, USA)

Measuring Consumption Changes in Rural Villages based on Satellite Image Data - A Case Study for Thailand and Vietnam Fabian Wölk, Tingting Yuan, Krisztina Kis-Katos, Xiaoming Fu (University of Göttingen, Germany)

Towards DTW-based Unlock Scheme using Handwritten Graphics on Smartphones

Li Wang, Weizhi Meng (Technical University of Denmark, Denmark), Wenjuan Li (The Hong Kong Polytechnic University, Hong Kong)

Deep Learning on Visual and Location Data for V2I mmWave Beamforming

Guillem Reus-Muns, Batool Salehi, Debashri Roy, Tong Jian, Zifeng Wang, Jennifer Dy, Stratis Ioannidis and Kaushik Chowdhury (Northeastern University, USA)

Long-Term Visual Localization with Semantic Enhanced Global Retrieval

Hongrui Chen, Yuan Xiong, Jingru Wang, Zhong Zhou (State Key Laboratory of Virtual Reality Technology and Systems, China)

Learning Discriminative Features for Adversarial Robustness

Ryan Hosler, Tyler Phillips, Xiaoyuan Yu, Agnideven Sundar, Xukai Zou, Feng Li (Indiana University Purdue University Indianapolis, USA)

Wednesday, 15 December 2021 | 13:00 - 15:00 (London Time) Wednesday, 15 December 2021 | 21:00 - 23:00 (Beijing Time) Wednesday, 15 December 2021 | 08:00 - 10:00 (New York Time)

Session MSN-14: Wireless Sensing (Room 3, 13:00-15:00)

Session Chair: Mircea Stan (University of Virginia, USA)

Distributed Routing Protocol for Large-Scale Backscatter-enabled Wireless Sensor Network

Fengyu Zhou, Hao Zhou, Shan Wang, Wangqiu Zhou (University of Science and Technology of China, China), Zhi Liu (The University of Electro-Communications, Japan), Xiangyang Li (University of Science and Technology of China, China)

RF-Vsensing: RFID-based Single Tag Contactless Vibration Sensing and Recognition

Biaokai Zhu, Liyun Tian (Shanxi Police College, China), Die Wu (Sichuan Normal University, China), Meiya Dong (Taiyuan University of Technology, China), Sheng Gao, Lu Zhang, Sanman Liu (Shanxi Police College, China), Deng-Ao Li (Taiyuan University of Technology, China)

SecQSA: Secure Sampling-Based Quantile Summary Aggregation in Wireless Sensor Networks

Aishah Aseeri, Rui Zhang (University of Delaware, USA)

A robust fixed path-based routing scheme for protecting the source location privacy in WSNs Lingling Hu, Liang Liu, Yulei Liu, Wenbin Zhai, Xinmeng Wang (Nanjing University of Aeronautics and Astronautics, China)

Deep Transfer Learning for Cross-Device Channel Classification in mmWave Wireless

Ahmed Almutairi, Suresh Srinivasan (Portland State University, USA), Alireza Keshavarz-Haddad (Shiraz University, Iran), Ehsan Aryafar (Portland State University, USA)

Wednesday, 15 December 2021 | 13:00 - 15:00 (London Time) Wednesday, 15 December 2021 | 21:00 - 23:00 (Beijing Time) Wednesday, 15 December 2021 | 08:00 - 10:00 (New York Time)

Session MSN-15: Data Privacy (Room 4, 13:00-15:00)

Session Chair: Houbing Herbert Song (Embry-Riddle Aeronautical University, USA)

Blockchain-based Access Control for Privacy Preserving of Students' Credit Information

Quanwen He, Hui Lin (Fujian Normal University, China), Fu Xiao (Nanjing University of Posts and Telecommunications, China), Jia Hu (University of Exeter, UK), Xiaoding Wang (Fujian Normal University, China)

Collecting Spatial Data Under Local Differential Privacy

Yutong Ye, Min Zhang, Dengguo Feng (Institute of Software, Chinese Academy of Sciences (CAS), China)

DPFDT: Decentralized Privacy-preserving Fair Data Trading System

Xiangyu Li, Zhenfu Cao, Jiachen Shen, Xiaolei Dong (East China Normal University, China)

Towards Efficient Co-aduit of Privacy-Preserving Data on Consortium Blockchain via Group Key Agreement

Xiaoyan Hu, Xiaoyi Song, Guang Cheng, Jian Gong (Southeast University, China), Lu Yang, Honggang Chen, Zhichao Liang (JiangSu Peerfintech Technology Co., Ltd., China)

Wednesday, 15 December 2021 | 15:15 - 17:40 (London Time) Wednesday, 15 December 2021 | 23:15 - 01:40(+1) (Beijing Time) Wednesday, 15 December 2021 | 10:15 - 12:40 (New York Time)

Session MSN-16: 5G and beyond (Room 2, 15:15-17:40)

Session Chair: Richard Li (Futurewei Technologies Inc., USA)

Analyzing a 5G Dataset and Modeling Metrics of Interest Fidan Mehmeti, Thomas La Porta (The Pennsylvania State University, USA)

Towards an Energy-Efficient DQN-based User Association in Sub6GHz/mmWave Integrated Networks Thi Ha Ly Dinh, Megumi Kaneko (National Institute of Informatics, Japan), Keisuke Wakao, Kenichi Kawamura, Takatsune Moriyama, Yasushi Takatori (NTT Corporation, Japan)

Qualitative Communication for Emerging Network Applications with New IP

Richard Li, Lijun Dong, Cedric Westphal, Kiran Makhijani (Futurewei Technologies Inc., USA)

FullSight: Towards Scalable, High-Coverage, and Fine-grained Network Telemetry

Sen Ling, Waixi Liu, Yinghao Zhu, Miaoquan Tan, Jieming Huang, Zhenzheng Guo, Wenhong Lin (Guangzhou University, China)

A Location-Aware Cross-Layer MAC Protocol for Vehicular Visible Light Communications Agon Memedi, Falko Dressler (TU Berlin, Germany)

From Wired to Wireless BMS in Electric Vehicles

Fabian Antonio Rincon Vija, Samuel Cregut (Renault Group, France), Georgios Papadopoulos, Nicolas Montavont (IMT Atlantique, France)

Wednesday, 15 December 2021 | 15:15 - 17:40 (London Time) Wednesday, 15 December 2021 | 23:15 - 01:40(+1) (Beijing Time) Wednesday, 15 December 2021 | 10:15 - 12:40 (New York Time)

Session MSN-17: Resource Management (Room 3, 15:15-17:40) Session Chair: Zhenming Liu (College of William and Mary, USA)

Modeling and Analysis of Medical Resource Sharing and Scheduling for Public Health Emergencies based on Petri Nets Wangyang Yu, Menghan Jia (Shaanxi Normal University, China), Bo Yuan (University of Derby, UK)

Rosella: A Self-Driving Distributed Scheduler for Heterogeneous Clusters

Qiong Wu, Zhenming Liu (College of William and Mary, USA)

The algorithm of multi-source to multi-sink traffic scheduling

Yang Liu, Lei Liu, Zhongmin Yan (Shandong University, China), Jia Hu (University of Exeter, UK)

A Distributed Hybrid Load Management Model for Anycast CDNs

Jing'an Xue (Huawei Technologies, China), Haibo Wang, Jilong Wang (Tsinghua University, China), Zhe Chen, Chuang Wang, Tong Li (Huawei Technologies, China)

A Node Importance Ranking Method Based on the Rate of Network Entropy Changes

Qian Chen, Changda Wang, Qian Chen, Xian Zhao, Wenyue Sun (Jiangsu University, China)

Personalized Path Recommendation with Specified Way-points Based on Trajectory Representations Wang Bing, Guo Yuchun, Chen Yishuai (Beijing Jiaotong University, China)

Wednesday, 15 December 2021 | 17:40 - 17:50 (London Time) Wednesday, 15 December 2021 | 01:40 - 01:50(+1) (Beijing Time) Wednesday, 15 December 2021 | 12:40 - 12:50 (New York Time) Closing