2019 IEEE International Conference on Smart Internet of Things

IEEE SmartIoT 2019

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Introduction

2019 IEEE International Conference on Smart Internet of things

SmartIoT 2019

Tianjin, China, 9-11 August, 2019

Internet of Things (IoT) plays an important role in the current and future generation of information, network, and communication developing and applications. Smart IoT is an exciting emerging research field that has great potential to transform both our understanding of fundamental computer science principles and our standard of living. IoT is being employed in more and more areas making "Everything Smart", such as smart home, smart city, intelligent transportation, environment monitoring, security systems, and advanced manufacturing. IEEE International Conference on Smart Internet of Things (IEEE SmartIoT) focuses on these challenges.

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Welcome Message from the General Chairs

On behalf of the General chairs and on behalf of the Organizing Committee, it is our honor to welcome you to the 2019 IEEE 3rd International Conference on Smart Internet of Things (IEEE SmartIoT 2019), sponsored by IEEE and IEEE Computer Society.

The aim of the conference is to provide an international forum that brings together researchers from academia and practitioners from industry to exchange advances in recent research work on all aspects of Internet of Things. We are pleased that SmartIoT 2019 is held in Tianjin this year. Tianjin is one of the four municipalities in China, a historical and vibrant city with over 10 million residents. Tianjin has a rich history and has many examples of old British and Italian architecture. The famous Italian concession area has the largest cluster of old Italian architecture outside of Italy. This city has retained an authentic Chinese way of life. Tianjin has a reputation throughout China for being extremely friendly, safe and a place of delicious food.

The technical program committee worked hard to guarantee a successful conference. The proceedings of the Conference will be published by the Computer Society Press (CPS) and the IEEE Explore and the IEEE Explore. Many individuals have contributed to the success of this high caliber international conference. We would like to express our special appreciation to the Steering Committee Chairs for giving us this opportunity to hold this prestigious conference and for their guidance on the conference organization. We would also like to give our thanks to all the members of the Organizing Committee and Program Committee members for their efforts and support.

We are grateful to the authors of all submitted papers for choosing SmartIoT 2019 as the forum to present their work. We hope all the participants find the conference stimulating and constructive. We also hop you will take this opportunity to visit the beautiful Tianjin city, and enjoy your stay in Tianjin.

Thank you. We look forward to welcoming you in Tianjin in August 2019.

Mahmoud Daneshmand, Keqiu Li, Dapeng Oliver Wu
General Chairs, IEEE SmartIoT 2019

SmartIoT 2019
Technical Program at a Glance

Day 1 – August 9th, 2019 (Friday)			
13:00-22:00	(1F·Lobby)		
18:00-21:00	Welcome Reception (1F·Victoria）		
Day 2 – August 10th, 2019 (Saturday)			
Victoria International Hotel			
09:00-09:30	Opening Remark (10F·DRAGON & PHOENIX HALL-B)		
09:30-10:30	Keynotes Speech 1: Creating Autonomous Vehicle Systems Prof. Jean-Luc Gaudiot, University of California - Irvine Chair: Tie Qiu		
10:30-10:50	Coffee Break		
10:50-11:50	Keynotes Speech 2: Scheduling in 5G for IoT Applications Prof. Tom Hou, Virginia Tech Chair: Huansheng Ning		
	Lunch (1F·Victoria）		
	11F·Meeting Room 1	**11F·Meeting Room 2**	**11F·Meeting Room 3**	**11F·Hallway**
13:30-15:10	**R1**: IoT Sensing, Monitoring, Networking and Routing	**R3**: Edge Computing/Fog Computing	**R5**: Artificial Intelligence, Machine learning and Evolutionary Computing	**Poster session**
15:10-15:30	Coffee Break		
15:30-17:10	**R2**: Big Data Analysis and Cloud Computing	**R4**: Smart Cities, Intelligent Transportation and Internet of Vehicles	**R6**: Social Networks, Multimedia and Mobile Computing	**Poster session**
18:00-21:00	Banquet (10F·DRAGON & PHOENIX HALL-B)		
Day 3 – August 11st, 2019 (Sunday)			
Victoria International Hotel			
	11F·Meeting Room 1	**11F·Meeting Room 2**	**11F·Meeting Room 3**
08:30-10:10	**R7**: Blockchain and Emerging Research or Technologies	**R8**: Control and Decision Making for Smart IoT or CPS	**R9**: Security and Privacy for Smart IoT or CPS
10:10-10:30	Coffee Break		
10:30-12:00	**S1**. IoT Sensing, Monitoring, Networking and Routing	**S2**: Smart Cities, Big Data Analysis and Cloud Computing	**S3**: Edge Computing/Fog Computing
12:00-13:00	Lunch (1F·Victoria）		
13:30-15:00	**S4**: Artificial Intelligence, Machine learning and Evolutionary Computing	**S5**: Industrial 4.0 and Industrial IoT	**S6**: Security and Privacy for Smart IoT or CPS
15:00-17:00	Organizing committee and steering committee meeting (11F·Meeting Room 1)		

Keynotes Speech 1

Prof. Jean-Luc Gaudiot

IEEE Fellow, AAAS Fellow ,2017 IEEE Computer Society President, Eta Kappa Nu, Honor Society of IEEE, Professional Member (inducted December 11, 2015) University of California – Irvine

Topic

Creating Autonomous Vehicle Systems

Abstract

In this technical overview of autonomous vehicles, we share our practical experiences designing autonomous vehicle systems. Autonomous vehicle systems are complex, consisting of three major subsystems: algorithms for localization, perception, and planning and control; client systems, such as the robotics operating system and hardware platform; and the cloud platform, which includes data storage, simulation, high-definition (HD) mapping, and deep learning model training. The algorithm subsystem extracts meaningful information from sensor raw data to understand its environment and make decisions about its actions. The client subsystem integrates these algorithms to meet real-time and reliability requirements. The cloud platform provides offline computing and storage capabilities for autonomous vehicles. Using the cloud platform, we are able to test new algorithms and update the HD map and develop better recognition, tracking, and decision models.

Biography

Professor Jean-Luc Gaudiot received the Diplôme d'Ingénieur from the École Supérieure d'Ingénieurs en Electronique et Electrotechnique, Paris, France in 1976 and the M.S. and Ph.D. degrees in Computer Science from the University of California, Los Angeles in 1977 and 1982, respectively. He is currently a Professor in the Electrical Engineering and Computer Science Department at the University of California, Irvine. He was Chair of the Department from 2003 to 2009. During his tenure, the department underwent significant changes. These include the hiring of twelve new faculty members (three senior professors) and the remarkable rise in the US News and World Report® rankings of the Computer Engineering program from 42 to 28 (46 to 36 for the Electrical Engineering program). Prior to joining UCI in January 2002, he was a Professor of Electrical Engineering at the University of Southern California since 1982, where he served as Director of the Computer Engineering Division for three years. He has also designed distributed microprocessor systems at Teledyne Controls, Santa Monica, California (1979-1980) and performed research in innovative architectures at the TRW Technology Research Center, El Segundo, California (1980-1982). He frequently acts as consultant to companies that design high-performance computer architectures, and has served as an expert witness in patent infringement and product liability cases. His research interests include multithreaded architectures, fault-tolerant multiprocessors, and implementation of reconfigurable architectures. He has published over 200 journal and conference papers. His research has been sponsored by NSF, DoE, and DARPA, as well as a number of industrial organizations. From 2006 to 2009, he was the first Editor-in-Chief of the IEEE Computer Architecture Letters, a new publication of the IEEE Computer Society, which he helped found to the end of facilitating short, fast turnaround of fundamental ideas in the Computer Architecture domain. From 1999 to 2002, he was the Editor-in-Chief of the IEEE Transactions on Computers. In June 2001, he was elected chair of the IEEE Technical Committee on Computer Architecture, and re-elected in June 2003 for a second two-year term. In 2009, he was elected to the Board of Governors of the IEEE Computer Society for a 3-year-term. He was the Chair of the IEEE Computer Society Publications Board Transactions Operations Committee (2010-2011), the Chair of the IEEE Computer Society Publications Board Magazines Operations Committee in 2012, the IEEE Computer Society vice President, Educational Activities Board in 2013, and 2014-2015 IEEE Computer Society vice President, Publications Board. He is now the 2017 IEEE Computer Society President. Dr. Gaudiot is a member of AAAS, ACM, and IEEE. He has also chaired the IFIP Working Group 10.3 (Concurrent Systems). He was co-General Chairman of the 1992 International Symposium on Computer Architecture, Program Committee Chairman of the 1993 IFIP Working Conference on Architectures and Compilation Techniques for Fine and Medium Grain Parallelism, the 1993 IEEE Symposium on Parallel and Distributed Processing (Systems Track), the 1995 Parallel Architectures and Compilation Techniques Conference (PACT '95), the High Performance Computer Architecture conference in 1999 (HPCA-5), and the 2005 International Parallel and Distributed Processing Symposium. In 1999, he became a Fellow of the IEEE, "For Contributions to the Programmability and Reliability of Dataflow Architectures." He was elevated to the rank of AAAS Fellow in 2007, "For Distinguished Contributions to the Design and Analysis of Highly Efficient Multiprocessor and Memory System Architectures."

Keynotes Speech 2

Prof. Tom Hou

IEEE Fellow, Chair of
IEEE INFOCOM Steering
Committee
Virginia Tech

Topic
Scheduling in 5G for IoT Applications

Abstract
As the next-generation cellular communication technology, 5G New Radio (NR) aims to cover a wide range of service cases, including broadband human-oriented communications, time-sensitive applications with ultra-low latency, and massive connectivity for Internet of Things. With its broad range of operating frequencies, the channel coherence time for NR varies greatly. To address such needs, a number of different OFDM numerologies are defined for NR, allowing a wide range of frequency and time granularities for data transmission. Under this numerology, it is necessary to perform scheduling with a time resolution as small as ~100 μs. This requirement poses a new challenge that does not exist in LTE and cannot be supported by any existing LTE schedulers. In this talk, I will present the design of GPF − and GPU-based proportional fair (PF) scheduler that can meet the ~100 μs time requirement. The key ideas in the design include decomposing the scheduling problem into a large number of small and independent sub-problems and selecting a subset of sub-problems from the most promising search space to fit into a GPU platform. By implementing GPF on an off-the-shelf Nvidia Quadro P6000 GPU, we show that GPF is able to achieve near-optimal performance while meeting the ~100 μs time requirement. GPF represents the first successful design of a GPU-based PF scheduler that can meet the new time requirement in 5G NR.

Biography
Tom Hou is the Bradley Distinguished Professor of Electrical and Computer Engineering at Virginia Tech, USA. He received his Ph.D. degree from NYU Tandon School of Engineering (formerly Polytechnic University) in 1998. His current research focuses on developing innovative solutions to complex science and engineering problems arising from wireless and mobile networks. He is particularly interested in exploring new performance limits at the network layer by exploiting advances at the physical layer. In recent years, he has been actively working on cross-layer optimization problems for cognitive radio wireless networks, cooperative communications, MIMO-based networks and energy related problems. He is also interested in wireless security. Prof. Hou was named an IEEE Fellow for contributions to modeling and optimization of wireless networks. He has published two textbooks: Cognitive Radio Communications and Networks: Principles and Practices (Academic Press/Elsevier, 2009) and Applied Optimization Methods for Wireless Networks (Cambridge University Press, 2014). The first book has been selected as one of the Best Readings on Cognitive Radio by the IEEE Communications Society. Prof. Hou's research was recognized by five best paper awards from the IEEE and two paper awards from the ACM. He holds five U.S. patents.

Prof. Hou is a prominent leader in the research community. He was an Area Editor of IEEE Transaction on Wireless Communications (Wireless Networking area), and an Editor of IEEE Transactions on Mobile Computing, IEEE Journal on Selected Areas in Communications − Cognitive Radio Series, and IEEE Wireless Communications. Currently, he is an Editor of IEEE/ACM Transactions on Networking and ACM Transactions on Sensor Networks. He is the Steering Committee Chair of IEEE INFOCOM conference − the largest and top ranked conference in networking. He is a member of the Board of Governors as well as a Distinguished Lecturer of the IEEE Communications Society.

Full Program

Time	Talks
Day 2 – August 10th, 2019 (Saturday) – 11F·Meeting Room 1
13:30-15:10	**R1: IoT Sensing, Monitoring, Networking and Routing** **Chair: Wenbing Zhao, Cleveland State University, USA**
	1. A New Method of Mobile Ad Hoc Network Routing Based on Improved GF Strategy Ke Li (Tianjin Key Lab of Intelligent Computing & Novel software Technology, Tianjin University of Technology), De-gan Zhang (TJUT), Jian-ning Qiu (TJUT), and Lu Chen (Tianjin University of Technology)
	2. Flow-Based Channel and Timeslot Co-Scheduling for Real-Time Data Aggregation in MWSNs Benhong Zhang (Hefei University of Technology), Yongzhao Wu (Hefei University of Technology), Lei Yu (Anhui University of Chinese Medicine), and Xiaoqian Wang (Hefei University of Technology)
	3. Energy-Efficiency-Aimed Radio Resource Scheduling for D2D Communications Underlaying Cellular Network Zefang Lin (South China Normal University), Daru Pan (South China Normal University), and Hui Song (South China Normal University)
	4. An Online Computation Offloading with Energy-Harvesting in Mobile ad Hoc Network Weiping Wang (Harbin Engineering University), Guangsheng Feng (Harbin Engineering University), Bingyang Li (Harbin Engineering University), Yingying Yuan (Harbin Engineering University), Quanming Li (Harbin Engineering University), Hongwu Lv (Harbin Engineering University), and Qian Zhao (Harbin University of Commerce)
	5. Modeling and Evaluation of a Power-Aware Algorithm for IoT Bluetooth Low Energy Devices M. Carmen Ruiz (University of Castilla-La Mancha), Celia Garrido-Hidalgo (Albacete Research Institute of Informatics), Damas P. Gruska (Comenius University), Teresa Olivares (University of Castilla-La Mancha), Diego Hortelano (Albacete Research Institute of Informatics), and Luis Roda-Sanchez (Albacete Research Institute of Informatics)
15:10-15:30	**Coffee Break**
15:30-17:10	**R2: Big Data Analysis and Cloud Computing** **Chair: Guangsheng Feng, Harbin Engineering University, China**
	1. Grey Fault Detection Method Based on Application Interference Model in Cloud Storage Birui Liang (Guangxi University), Ningjiang Chen (Guangxi University), Yongsheng Xie (Guangxi University), and Yuhua Chen (Guangxi University)
	2. More Competitive Feature Extraction Network for Instance Segmentation Ying Xu (Chang'an University), Huixiang Qiao (Chang'an University), Yongping Zhang (Ningbo University of Techology), Lei Lei (Shanghai University), and Tuozhong Yao (Ningbo University of Techology)
	3. Temperature Prediction Intelligent System Based on BP Neural Network in Wireless Industrial IoT Hairong Yan (Beijing University of Technology), Kai Lu (Beijing University of Technology), Michele Luvisotto (KTH Royal Institute of Technology), and Siyu Jiang (Beijing University of Technology)
	4. Large Distributed Virtual Infrastructure Partitioning and Provisioning Across Provider Huan Zhou (University of Amsterdam), Zeshun Shi (University of Amsterdam), Pieter Donkers (University of Amsterdam), Andrey Afanasyev (University of Amsterdam), Spiros Koulouzis (University of Amsterdam), Arie Taal (University of Amsterdam), Alexandre Ulisses (MOG Technologies), and Zhiming Zhao (University of Amsterdam)
	5.Mining Expected Support-Based Frequent Itemsets by Sampling Fengjuan Chen (Dalian Maritime University), Wenyu Qu (Tianjin University), Zhiyang Li (Dalian Maritime University), and Zhaobin Liu (Dalian Maritime University)
13:30-17:10	**Poster Session - 11F·Hallway**
	1. Research on the Process of Nickel Film Plating Jiaji Ma (Xidian University) and Chen Chen (Xidian University)
	2. A Neural-Network-Based Real-end Collision Prediction Mechanism for Smart Cities Xin Wang (Dalian University of Technology), Tie Qiu (Tianjin University), Chen Chen (Xidian University), and Ning Chen (Dalian University of Technology)
	3. Month-Ahead Wind Power Deterministic Prediction Based on Combination Method Yihe Wang (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Yi Liang (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Liu Yan (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Xiaotian Zhang (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Zhe Nan (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Na Zhang (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), and Feng Yan (Department of Electrical and Electronic Engineering, North China Electric Power University)
	4. 3D Skeleton-Based Video Action Recognition by Graph Convolution Network Xuesong Gao (Tianjin University; State Key Laboratory of Digital Multimedia Technology), Keqiu Li (Tianjin University), Yu Zhang (State Key Laboratory of Digital Multimedia Technology), Qiguang Miao (Xidian University), Lijie Sheng (Xidian University), Jun Xie (Xidian University), and Jinfu Xu (Xidian University)

Time	Talks
	Day 2 – August 10th, 2019 (Saturday) – 11F·Meeting Room 2
13:30-15:10	**R3: Edge Computing/Fog Computing** **Chair: Weifeng Sun, Dalian University of Technology, China** 1. Edge Computing for Terminal Query Based on IoT Jianwen Ding (School of Information, Central University of Finance and Economics, Beijing, China) and Dan Fan (School of Information, Central University of Finance and Economics, Beijing, China) 2. Distributed Computation Offloading Based on Stochastic Game in Multi-server Mobile Edge Computing Networks Shuang Chen (Beijing Information Science and Technology University), Xin Chen (Beijing Information Science and Technology University), Ying Chen (Beijing Information Science and Technology University), and Zhuo Li (Beijing Information Science and Technology University) 3. Application of Edge Intelligent Computing in Satellite Internet of Things Junyong Wei (University of Chinese Academy of Sciences & Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences) and Suzhi Cao (Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences & Key Laboratory of Space Utilization, Chinese Academy of Sciences) 4. Joint Computation Offloading and Resource Management for USVs Cluster of Fog-Cloud Computing Architecture Kuntao Cui (Navigation College of Dalian Maritime University), Wenli Sun (Navigation College of Dalian Maritime University), and Wenqiang Sun (Navigation College of Dalian Maritime University) 5. An Artificial Intelligence Perspective on Mobile Edge Computing Zhuang Chen (Guilin University of Electronic Technology, China; CETC Key Laboratory of Aerospace Information Applications, China), Qian He (Guilin University of Electronic Technology, China; CETC Key Laboratory of Aerospace Information Applications, China), Lei Liu (Xidian University), Dapeng Lan (University of Oslo), Hwei-Ming Chung (University of Oslo), and Zhifei Mao (Norwegian University of Science and Technology (NTNU))
15:10-15:30	**Coffee Break**
15:30-17:10	**R4: Smart Cities, Intelligent Transportation and Internet of Vehicles** **Chair: Zhuo Li, Beijing Information Science and Technology, China** 1. A Greedy Multiple Fixed Node Networking Algorithm for Indoor Environmental Monitoring Scenarios Shengming Li (Dalian University of Technology), Wenqiang Xu (Dalian University of Technology), Lin Feng (Dalian University of Technology), and Tie Qiu (Tianjin University) 2. Room Geometry Reconstruction Based on Speech and Acoustic Image Methodology Xiyu Song (Guilin University of Electronic Technology), Mei Wang (GuiLin University of Technology), and Hongbing Qiu (Guilin University of Electronic Technology) 3. Driver' s Emotional State-Based Data Anomaly Detection for Vehicular Ad Hoc Networks Nan Ding (Dalian University of Technology), HaoXuan Ma (Dalian University of Technology), ChuanGuo Zhao (Dalian University of Technology), YanHua Ma (Dalian University of Technology), and HongWei Ge (Dalian University of Technology) 4. Air Quality Monitoring Using IoT: A SurveyHocine Mokrani (LIMOSE Laboratory of the M'Hamed Bougara University of Boumerdès.), Razika Lounas (LIMOSE Laboratory of the M'Hamed Bougara University of Boumerdès.), Mohamed Tahar Bennai (LIMOSE Laboratory of the M'Hamed Bougara University of Boumerdès.), Dhai Eddine Salhi (LIMOSE Laboratory of the M'Hamed Bougara University of Boumerdès.), and Rachid Djerbi (LIMOSE Laboratory of the M'Hamed Bougara University of Boumerdès.) 5. Vehicle Attribute Recognition Algorithm Based on Multi-task Learning Jingying Sun (University of Science and Technology Beijing), Chengzhe Jia (Beijing University of Technology), and Zhiguo Shi (University of Science and Technology Beijing)

Day 2 – August 10th, 2019 (Saturday) – 11F·Meeting Room 3	
Time	**Talks**
13:30-15:10	**R5: Artificial Intelligence, Machine learning and Evolutionary Computing** **Chair: Chen Chen, Xidian University, China**
	1. AEH-MTD: Adaptive Moving Target Defense Scheme for SDN Zhenpeng Liu (Hebei University), Yupeng He (Hebei University), Wensheng Wang (Hebei University), Shuo Wang (Hebei University), Xiaofei Li (Hebei University), and Bin Zhang (Hebei University)
	2. Novel Approach of The Best Path Selection Based on Prior Knowledge Reinforcement Learning Xiao-huan Liu (Tianjin University of Technology), De-gan Zhang (Tianjin University of Technology), Ting Zhang (Tianjin University of Technology), and Yu-ya Cui (Tianjin University of Technology)
	3. Floating-Point Multiplication Timing Attack on Deep Neural Network Gaofeng Dong (Key Laboratory of Electromagnetic Space Information, CAS, University of Science and Technology of China), Ping Wang (Key Laboratory of Electromagnetic Space Information, CAS, University of Science and Technology of China), Ping Chen (Key Laboratory of Electromagnetic Space Information, CAS, University of Science and Technology of China), Ruizhe Gu (Key Laboratory of Electromagnetic Space Information, CAS, University of Science and Technology of China), and Honggang Hu (Key Laboratory of Electromagnetic Space Information, CAS, University of Science and Technology of China)
	4. A Novel Crowd Counting Method via Deep Convolutional Neural Network Junfeng Wu (Tianjin University), Wenyu Qu (Tianjin University), Hong Yu (Dalian Ocean University), Yizhi Zhou (Dalian Ocean University), and Zhen Cui (Dalian Ocean University)
	5.Deep Reinforcement Learning Based Dynamic Resource Allocation in 5G Ultra-Dense Networks Zhiyong Liu (Beijing Information Science and Technology University), Xin Chen (Beijing Information Science and Technology University), Ying Chen (Beijing Information Science and Technology University), and Zhuo Li (Beijing Information Science and Technology University)
15:10-15:30	**Coffee Break**
15:30-17:10	**R6: Social Networks, Multimedia and Mobile Computing** **Chair: Nan Ding, Dalian University of Technology, China**
	1. Feature-Specific Named Entity Recognition in Software Development Social Content Ning Li (Beijing Information Science and Technology University), Liwei Zheng (Beijing Information Science and Technology University), Ying Wang (Beijing Information Science and Technology University), and Bin Wang (Beijing Information Science and Technology University)
	2. A Near-Optimal Resource Allocation Approach to Computation Offloading Under D2D Communications Yingying Yuan (Harbin Engineering University), Guangsheng Feng (Harbin Engineering University), Hongwu Lv (Harbin Engineering University), Weiping Wang (Harbin Engineering University), Quanming Li (Harbin Engineering University), Di He (Harbin Engineering University), and Huiqiang Wang (Harbin Engineering University)
	3. Mobility Aware Duty Cycling Algorithm (MADCAL) in Wireless Sensor Network with Mobile Sink Node Craig Thomson (Edinburgh Napier University), Isam Wadhaj (Edinburgh Napier University), Zhiyuan Tan (Edinburgh Napier University), and Ahmed Al-Dubai (Edinburgh Napier University)
	4. Mining Task Offloading in Mobile Edge Computing Empowered Blockchain Ke Zhang (University of Electronic Science and Technology of China), Jiayu Cao (University of Electronic Science and Technology of China), Supeng Leng (University of Electronic Science and Technology of China), Caixing Shao (Southwest Minzu University), and Yan Zhang (University of Oslo, Norway)
	5. Parameters Optimization of Photovoltaic Power Generation System Based on Multi-time Scale Reduction Zhanjun Li (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Xiao Pan (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Yihe Wang (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Xinyang Deng (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Xianglin Li (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), Hua Li (Economic and Technical Research Institute of Liaoning Electric Power Co., Ltd.), and Feng Yan (North China Electric Power University)

Day 3 – August 11st, 2019 (Sunday) – 11F·Meeting Room 1	
Time	**Talks**
	R7: Blockchain and Emerging Research or Technologies **Chair: Hazzaa Alshareef, Saudi Electronic University, Saudi Arabia**
08:30-10:10	1. A Blockchain System for E-Learning Assessment and Certification Chuyang Li (Beijing Normal University), Junqi Guo (Beijing Normal University), Guangzhi Zhang (Beijing Normal University), Yaofei Wang (Beijing Normal University), Yunchuan Sun (Beijing Normal University), and Rongfang Bie (Beijing Normal University)
	2. Enhanced and Lock-Free Tendermint Blockchain Protocol Basem Assiri (Jazan University) and Wazir Zada Khan (Jazan UNiversity)
	3. Crowdchain: A Location Preserve Anonymous Payment System Based on Permissioned Blockchain Hao Wang (Northwestern Polytechnical University), Zhiwen Yu (Northwestern Polytechnical University), Yimeng Liu (Northwestern Polytechnical University), Bin Guo (Northwestern Polytechnical University), Liang Wang (Northwestern Polytechnical University), and Helei Cui (Northwestern Polytechnical University)
	4. Towards an Effective Management of IoT by Integrating Cloud and Fog Computing Hazzaa Alshareef (Saudi Electronic University (SEU), Saudi Arabia), Marwah Almasri (Saudi Electronic University (SEU), Saudi Arabia), Abdulaziz Albesher (Saudi Electronic University (SEU), Saudi Arabia), and Dan Grigoras (University College Cork (UCC), Cork, Ireland)
	5. A Trust Chain Assessment Method Based on Blockchain for SDN Network Nodes Yifan Liu (Wuhan University), Bo Zhao (Wuhan University), Xiaofei Li (Hebei University), Shuo Wang (Hebei University), Bin Zhang (Hebei University), and Zhenpeng Liu (Hebei University)
10:10-10:30	**Coffee Break**
10:30-12:00	**S1. IoT Sensing, Monitoring, Networking and Routing** **Chair: Lin Feng, Dalian University of Technology, China**
	1. Architecture of Audio Broadcasting Coverage Monitoring System Based on Internet of Things Haocheng Huang (Communication University of China)
	2. Enabling Interoperability of Heterogeneous Identifiers of IoT via Semantic Code Xiaotao Li (China Mobile Research Institute), Shujuan You (China Mobile Research Institute), and Wai Chen (China Mobile Research Institute)
	3. A Fast Online Cascaded Regression Algorithm for Face Alignment Lin Feng (Dalian University of Technology), Caifeng Liu (Dalian University of Techonology), Shenglan Liu (Dalian University of Technology), and Huibing Wang (Dalian Maritime University)
	4. Design and Implementation of IPv6 Over DTN Communication Protocol for Remote Areas Fangshuo Xin (Inner Mongolia University, Hohhot, China), Xiangyu Bai (Inner Mongolia University, Hohhot, China), and Qi Liu (Inner Mongolia University, Hohhot, China)
	5. Device-to-Device Wireless Caching Network Link Scheduling Algorithm Based on Bipartite Graph Xin Liu (South China Normal University), Daru Pan (South China Normal University), and Hui Song (South China Normal University)
	6. Non-Subsampled Shearlet Transform Based Seismic Data Denoising via Proximal Classifier with Consistency Yu Sang (Liaoning Technical University), Jinguang Sun (Liaoning Technical University), Xiangfu Meng (Liaoning Technical University), Haibo Jin (Liaoning Technical University), Yanfei Peng (Liaoning Technical University), and Xinjun Zhang (Liaoning Technical University)
13:30-15:00	**S4: Artificial Intelligence, Machine learning and Evolutionary Computing** **Chair: Xiaoqiang Zhu, Tianjin University, China**
	1. Object Detection and Analysis of Human Body Postures Based on TensorFlow Ling Xie (Communication University of China) and Xiao Guo (Communication University of China)
	2. Attention Based Speech Model for Japanese Recognization Deguo Mu (Beihang University), Tao Zhu (Beihang University), Guoliang Xu (AiEnglish Research Group AiEnglish Inc.), Han Li (Beihang University), Dongbin Guo (Beihang University), and Yongquan Liu (National Open University)
	3. Clothing Images Attributes Classification Based on Deep Neural Network Ning Lv (Xidian University), Huimin Yan (Xidian University), Shuangsi Zhu (Xidian University), Chen Chen (Xidian University), Zhenxing Niu (Xidian University), and Jianlong Zhang (Shaanxi Key Laboratory of Integrated and Intelligent Navigation)
	4. Variable Gain Iterative Learning Control with Initial Error Correction Ye Tian (Changchun University of Science and Technology), Yijun Wang (Changchun University of Science and Technology), Huan Liu (Changchun University of Science and Technology), Ruixin Miao (Changchun University of Science and Technology), and Ziqiang Hao (Changchun University of Science and Technology)
	5. Deep Reinforcement Learning Based Offloading Scheme for Mobile Edge Computing Pengfei Yao (Beijing Information Science & Technology University), Xin Chen (Beijing Information Science & Technology University), Ying Chen (Beijing Information Science & Technology University), and Zhuo Li (Beijing Information Science & Technology University)
	6. A Review of Research on Port Throughput Forecasting Yiying Li (Navigation College, Dalian Maritime University), Tieshan Li (Navigation College, Dalian Maritime University), Yi Zuo (Navigation College, Dalian Maritime University), C. L. Philip Chen (Navigation College, Dalian Maritime University; University of Macau), Qihe Shan (Navigation College, Dalian Maritime University), Yang Xiao (Navigation College, Dalian Maritime University; The University of Alabama), and Xiaoqing Fan (Dalian University of Technology)

Day 3 – August 11st, 2019 (Sunday) – 11F·Meeting Room 2	
Time	**Talks**
08:30-10:10	**R8: Control and Decision Making for Smart IoT or CPS** **Chair: Jiahui Jin, Southeast University, China**
	1. A Underwater Submarine Navigation Scheme Based on Sonar Buoy Array and Four-Dimensional Positioning Yudong Zhao (xidian university), Chen Chen (Xidian University), Qianru Chen (Xidian University), and Tingting Xiao (Xidian University)
	2. Hybrid Network Assisted Dynamic Worker Recruitment Algorithm Anqi Lu (Heilongjiang University) and Jinghua Zhu (Heilongjiang University)
	3. A SINS/DVL Integrated Navigation Positioning Method Based on Improved Adaptive Filtering Technology Yipeng Yang (The 712th Institute of China Shipbuilding Industry Corporation), Xiaozhen Yan (Harbin Institute of Technology at WeiHai), and Qinghua Luo (Harbin Institute of Technology at WeiHa)
	4. Color Recognition for Rubik's Cube Robot Lin Feng (Dalian University of Technology), Dong Jiang (Dalian University of Technology), Aibin Zhang (Dalian University of Technology), Shenglan Liu (Dalian University of Technology), Feilong Wang (Dalian University of Technology), and Yang Liu (Dalian University of Technology)
	5. Multi-objective Optimization of Resource Allocation for Uplink Transmission in Two-Tier Heterogeneous Cellular Networks Jianhui Wang (Xiangtan University), Haolin Liu (Xiangtan University), Xianxian Cao (Xiangtan University), Qingyong Deng (Xiangtan University), and Tingrui Pei (Xiangtan University)
10:10-10:30	**Coffee Break**
10:30-12:00	**S2: Smart Cities, Big Data Analysis and Cloud Computing** **Chair: Chun-Wei Tsai, National Chung-Hsing University, Taiwan**
	1. On Human Resource Management and Big Data Analysis Jiandong Zhang (Dalian Polytechnic University) and Hui Liu (Dalian Polytechnic University)
	2. Research on Situational Perception of Power Grid Business Based on User Portrait Zhiyong Yu (State Grid Corporation of China), Linlin Liu (Tianjin Yingdajincai Travel Services Co., Ltd.), Chen Chen (Tianjin Yingdajincai Travel Services Co., Ltd.), Weitao Zhang (Tianjin Yingdajincai Travel Services Co., Ltd.), Xianbin Ju (Tianjin Yingdajincai Travel Services Co., Ltd.), and Lei Zhang (Tianjin Yingdajincai Travel Services Co., Ltd.)
	3. A GIS-Based Optimize Routing Algorithm for VANET in Urban Scenarios Weifeng Sun (Dalian University of Technology), Minghan Jia (Dalian University of Technology), Shumiao Yu (Dalian University of Technology), Guanghao Zhang (Dalian University of Technology), and Tie Qiu (Tianjin University)
	4. Pay-Per-Pollution: Towards an Air Pollution-Aware Toll System for Smart Cities Sandro Rodriguez Garzon (Technische Universität Berlin) and Axel Küpper (Technische Universität Berlin)
	5. Mobile Phone Passive Positioning Through The Detection of Uplink Signal Yuhui Gao (Beijing University of Post and Telecommunication), Zhongliang Deng (Beijing University of Post and Telecommunication), Yao Zhang (Beijing University of Post and Telecommunication), Shihua Sun (Beijing University of Post and Telecommunication), and Zhen Li (Beijing University of Post and Telecommunication)
	6. A Design and Analysis Perspective on Architecting Memory Using Domain-Wall Memory Jinzhi Lai (Guangdong Industry Polytechnic; State Key Laboratory of Wide Bandgap Semiconductor Technology, Xidian University), Jueping Cai (State Key Laboratory of Wide Bandgap Semiconductor Technology, Xidian University), Lai Liu (State Key Laboratory of Integrated Services Networks, Xidian University), and Zhuoye Huang (Guangdong Industry Polytechnic)
13:30-15:00	**S5: Industrial 4.0 and Industrial IoT** **Chair: Xiaodong Dong, Tianjin University, China**
	1. Optical Fiber Defect Detection Method Based on DSSD Network Shiman Wang (Guangdong University of Technology), Liming Wu (Guangdong University of Technology), Wenhao Wu (Guangdong University of Technology), Junchao Li (Guangdong University of Technology), Xinying He (Guangdong University of Technology), and Feiyang Song (Guangdong University of Technology)
	2. Numerical Simulation of Aerodynamic Noise of Intelligent Propeller Aircraft Considering Ground Reflection Yan-ting Ai (Shenyang Aerospace University), Yuhang Wu (Shenyang Aerospace University), Zhi Wang (Shenyang Aerospace University), and Song Xiang (Liaoning Key Laboratory of General Aviation)
	3. RetinaNet-Based Visual Inspection of Flexible Materials Wenhao Wu (Guangdong University of Technology), Liming Wu (Guangdong University of Technology), Junchao Li (Guangdong University of Technology), Shiman Wang (Guangdong University of Technology), Gengzhe Zheng (Guangdong University of Technology), and Xinying He (Guangdong University of Technology)
	4. Super Resolution Image Reconstruction of Textile Based on SRGAN Junchao Li (Guangdong University of Technology), Liming Wu (Guangdong University of Technology), Shiman Wang (Guangdong University of Technology), Wenhao Wu (Guangdong University of Technology), Feiyang Song (Guangdong University of Technology), and Gengzhe Zheng (Guangdong University of Technology)
	5. Improved Collaborative Filtering Algorithm Based on Multi-dimensional Fusion Similarity Xiaoxuan Liu (The Hong Kong polytechnic university)
	6. Preference Aware User Pairing in Cognitive Radio Networks: A Coalition Game-Theoretic Approach Xiaofang Deng (Guilin University of Electronic Technology), Cuiling Li (Guilin University of Electronic Technology), Bingyi Guo (Guilin University of Electronic Technology), Lin Zheng (Guilin University of Electronic Technology), and Hongbing Qiu (Guilin University of Electronic Technology)

Time	Talks
Day 3 – August 11st, 2019 (Sunday) – 11F·Meeting Room 3

Time	Talks
	R9: Security and Privacy for Smart IoT or CPS **Chair: Xiulong Liu, Simon Fraser University, Canada**
08:30-10:10	1. Local Differential Privacy Preserving Mechanism for Multi-attribute Data in Mobile Crowdsensing with Edge Computing Zihui Song (Beijing Information Science & Technology University), Zhuo Li (Beijing Information Science & Technology University), and Xin Chen (Beijing Information Science & Technology University)
	2. An Efficient Privacy and Integrity Preserving Data Aggregation Scheme for Multiple Applications in Wireless Sensor Networks Qiang Zhou (Nanjing University of Aeronautics & Astronautics; Chuzhou University, China), Xiaolin Qin (Nanjing University of Aeronautics & Astronautics), Guoxiu Liu (Chuzhou University, China), Hui Cheng (Chuzhou University, China), and Huanhuan Zhao (Chuzhou University, China)
	3. A Multi-Agent System for Detecting Attacks on Connected Objects Guyot Tifaine (Centre de Recherche en Education de Nantes), Carlier Florent (Centre de Recherche en Education de Nantes), Renault Valérie (Centre de Recherche en Education de Nantes), and Leroux Pascal (Centre de Recherche en Education de Nantes)
	4. Dynamic Network Data Protection Algorithm Using Differential Privacy in Internet of Things Songyan Li (Dalian Maritime University), Kang Dong (Dalian Maritime University), Zhaobin Liu (Dalian Maritime University), and Zhiyang Li (Dalian Maritime University)
	5. Secure Healthcare Data Aggregation and Deduplication Scheme for FoG-Oriented IoT Ata Ullah (National University of Modern Languages, Islamabad, Pakistan.), Khubab Hamza (National University of Modern Languages, Islamabad, Pakistan), Muhammad Azeem (National University of Modern Languages, Islamabad, Pakistan), and Fadi Farha (University of Science and Technology Beijing (USTB), Beijing, China)
10:10-10:30	**Coffee Break**
	S3: Edge Computing/Fog Computing **Chair: Yanjun Shi, Dalian University of Technology, China**
10:30-12:00	1. Three-Real-Time Architecture of Industrial Automation Based on Edge Computing Su Weibin (Yunnan Technology and Business University), Liu Yun (Kunming University of Science and Technology), Du Yi (Kunming University of Science and Technology), Dong Yingguo (Yunnan Technology and Business University), Pan Mingbo (Yunnan Technology and Business University), and Xu Gang (Yunnan Technology and Business University)
	2. Green-Oriented Offloading and Resource Allocation by Reinforcement Learning in MEC Yingjie Yang (Beijing Information Science & Technology University), Xin Chen (Beijing Information Science & Technology University), Ying Chen (Beijing Information Science & Technology University), and Zhuo Li (Beijing Information Science & Technology University)
	3. Budget-Aware Equilibrium Offloading for Mobile Edge Computing Xiuyuan Yang (Dalian University of Technology) and Ran Bi (Dalian University of Technology)
	4. Service Resource Management in Edge Computing Based on Microservices Chien-Chang Liu (National Central University, Taiwan), Chien-Chang Huang (National Central University, Taiwan), Chia-Wei Tseng (National Central University, Taiwan), Yao-Tsung Yang (National Central University, Taiwan), and Li-Der Chou (National Central University, Taiwan)
	5. Construction of Classroom Teaching Model Based on the 5G Communication Technology Hanhui Lin (Guangdong University of Finance and Economics), Shaoqun Xie (Guangdong University of Finance and Economics), and Ken Cai (Zhongkai University of Agriculture and Engineering)
	6. DOA Estimation of Quasi-Stationary Signals Using Sparse Signal Reconstruction Aiguo Ji (Qingdao University of Technology), Weiping Liu (Qingdao University of Technology), and Zhiqiang Liu (Qingdao University of Technology)
	S6: Security and Privacy for Smart IoT or CPS **Chair: Xiaoqiang Zhu, Tianjin University, China**
13:30-15:00	1. Enhanced Timestamp Scheme for Mitigating Replay Attacks in Secure ZigBee Networks Fadi Farha (University of Science and Technology Beijing) and Huansheng Ning (University of Science and Technology Beijing)
	2. An Independent Individual Certification Scheme Based on Digital Watermark in WSNs Yan Xiao (Jiangxi University of Finance and Economics) and Guangyong Gao (Nanjing University of Information Science and Technology)
	3. A Secure and Power-Efficient Constellations for Physical Layer Security Weiqing Huang (Institute of Information Engineering, Chinese Academy of Sciences), Qiaoyu Zhang (Institute of Information Engineering/School of Cyber Security, Chinese Academy of Sciences), Dong Wei (Institute of Information Engineering, Chinese Academy of Sciences), and Huiyan Li (Institute of Information Engineering/School of Cyber Security, Chinese Academy of Sciences)
	4. Understanding and Measuring Risk due to Uncertainties in IoT Vangalur Alagar (Concordia University) and Kaiyu Wan (Xi'an Jiaotong-Liverpool University)
	5. An Effective Network Intrusion Detection Framework Based on Learning to Hash Wenrui Zhou (Dalian University of Technology), Yuan Cao (Dalian University of Technology), Heng Qi (Dalian University of Technology), and Junxiao Wang (Dalian University of Technology)

➡️ Venue

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Tianjin University is a National Key University directly under the administration of the Ministry of the Education, and its history can be traced back to Peiyang University, the first modern university in China, which was founded on October 2, 1895. It was renamed Tianjin University after the nationwide restructuring of colleges and departments in 1951. In 1959, Tianjin University was identified as one of the first batch of the 16 National Key Universities designated by the government, and it is also among the first group of institutions of higher learning to be included into the "211" and "985" Projects of national investment for developing world class universities. During the past 123 years, Tianjin University has made significant contributions to economic and social development, which must be due to its cultivation of a large number of high-level talents, and its outstanding achievements.

To build a strong nation, it is crucial for the education system to be set up and developed for the preservation of talents. The establishment and operation of the University aims to promote education for the ultimate improvement of national strength and prosperity, in accord with the University's motto of "Seeking Truth from Facts". The University exalts preservation of its own traditions, in which the spirit of "precision in learning and strictness in teaching" is encouraged. Patriotism and devotion to the country is also considered worthy goals to hold onto, tied in with multiple avenues to encourage undaunted inquiry into academic truth, to foster competent talent, to pass on the cultural heritages, to buttress the progress of our nation and to create a promising future.

In 2014, The constitution of Tianjin University was officially approved by the Ministry of Education and to further define the University's overall development goals facing the new century and the development and promotion of quality education. In 2015, the new campus, Peiyang Park Campus was opened and commenced operation, and nearly 20 thousand students, faculty and staff live there. The University also celebrated its 120th anniversary that year. Tianjin University intends to start a new cycle of sixty years with commencement of the new campus, accelerating the "three runs on foot" strategy of national economic development, adhering to "people-oriented vision, reform and innovation, highlighting unique strengths, and focusing on quality", promoting comprehensive reform in an all-round way, constantly improving the systems of a modern University, and striving for the goals of the world-class universities featuring "Comprehensiveness, Research, Openness and Internationalization".

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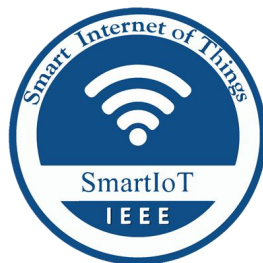
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