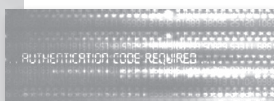


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IEEE INTERNATIONAL PERFORMANCE COMPUTING AND COMMUNICATIONS CONFERENCE



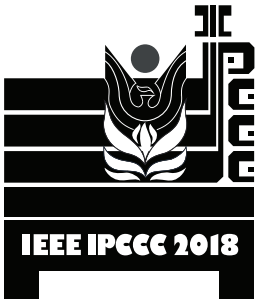
2018 Program Guide



Orlando, Florida USA • November 17-19, 2018

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

IPCCC.ORG



Message from the IPCCC 2018 General Chairs

It is our great pleasure to warmly welcome you to the 37th IEEE International Performance, Computing, and Communications Conference (IPCCC 2018) at Orlando, Florida, USA. IPCCC 2018 brings together researchers from academia, government, and industry around the world, to exchange their latest research achievements in computer and communication systems, as well as to inspire each other through discussion and presentations. We are very proud to see a high-quality conference program, including two keynote speeches, 66 papers in the main technical program, 9 papers in the workshop program, and 14 posters.

Firstly, we would like to thank all authors of the submitted and accepted papers. They make the conference great, and their contributions advance the fields. Secondly, we would like to express our appreciation to Program Co-Chairs Prof. Yingshu Li and Prof. Fan Li, all members of the Technical Program Committee, as well as external reviewers for their tremendous effort and hard work in paper selection. Their timely feedback is very valuable to both the conference and the authors. Thirdly, we would like to sincerely thank our organizing committee members, including but not limited to Co-General Vice-Chairs Prof. Xubin He and Prof. Peixiang Liu, Workshop Co-Chairs Prof. Amjad Gawanmeh and Prof. Abdel-Hameed Badawy, Poster Session Chair Prof. Ningfang Mi, Publications Chair Prof. Honggang Zhang, Publicity Co-Chairs Prof. Feng Wang, Prof. Nils Aschenbruck, Prof. Zhen Ling and Ms. Kathlene Hurt, Web Chair Neil Nelson, Financial Chair Nasr Ullah, and Registration Chair Jack Chen, for their enormous support and contribution in time. Their efforts make the conference possible. It has been a privilege for us to work with such a marvelous group of dedicated professionals.

Last but not least, we would like to thank IEEE Computer Society, Technical Committee on Computer Communications (TCCC), and Samsung Austin R&D Center (SARC) for their continuing sponsorship and support of this conference.

On behalf of the conference executive committee, we welcome you to IPCCC 2018 at the beautiful city of Orlando. We do hope that you will enjoy the technical programs and events, and have a wonderful time!

– Benyuan Liu and Xinwen Fu, IPCCC 2018 General Chairs

Message from the IPCCC 2018 Technical Program Chairs

We are delighted to welcome you to the 37th edition of IEEE International Performance Computing and Communications Conference (IPCCC 2018) in Orlando, Florida, USA, which is a premier conference on the performance of computer and communication systems.

Totally, for the main conference, we received 228 research papers and accepted only 66 papers, for an acceptance ratio of 28.9 percent. For the poster session, we received 30 submissions and accepted 14 papers to be presented as posters with an extended two-page abstract to be included in the proceedings. Moreover, 9 papers were accepted by the special session on Computing and Communications from IoTs to Data-Centric Systems. All the papers were submitted from 21 countries, and the authors of the accepted papers come from nine different countries including, in alphabetical order, Australia, Brazil, Canada, China, Ecuador, Japan, Pakistan, Portugal, and the USA. We hope these different forms of paper presentations during the conference can increase diversity and provide the authors with more opportunities to reach out to most of the attendees. All the submitted papers received at least three thorough reviews by our Technical Program Committee members and external reviewers.

The final technical program includes 16 technical sessions, one poster session, and one special session. Besides, two keynote speakers are invited to deliver keynote speeches. Our keynote speakers are Dr. Kien A. Hua from the University of Central Florida (Saturday, Nov. 17, 8 AM) and Dr. Tao Li from the University of Florida (Sunday Nov. 18, 8 AM). Our Technical Program Committee consists of 107 members, and we greatly appreciate their time and efforts. We would also like to thank the external reviewers for their support. Without the quality reviews from our Technical Program Committee members and external reviewers, the conference would not be successful. Furthermore, we would like to acknowledge our Co-General Chairs Prof. Benyuan Liu and Prof. Xinwen Fu, our Co-General Vice-Chairs Prof. Xubin He and Prof. Peixiang Liu, our Workshop Co-Chairs Prof. Amjad Gawanmeh and Prof. Abdel-Hameed Badawy, our Poster Session Chair Prof. Ningfang Mi, our Publications Chair Prof. Honggang Zhang, our Publicity Co-Chairs Prof. Feng Wang, Prof. Nils Aschenbruck, Prof. Zhen Ling, Ms. Kathlene Hurt, our Financial Chair Nasr Ullah, our Web Chair Neil Nelson, our Registration Chair Jack Chen, and many others for their responsible and hard work in making IPCCC 2018 a big success. Finally, we would like to thank all the authors and attendees for their support. We hope all of you can enjoy the conference and continue supporting IPCCC in the future.

– Yingshu Li & Fan Li, IPCCC 2018 Technical Program Co-Chairs

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IPCCC 2018 Day One – Saturday, November 17

➤ Registration (Room: Meyer Lobby) 7:00-8:00 AM ➤ Welcome Chair: Peixiang Liu (Room: Meyer) 7:45 AM

➤ Keynote I – 8:00-9:00 AM: Dr. Kien A. Hua, Professor of Computer Science, University of Central Florida
Addressing the Challenges of the Internet of Things in a Highly Connected World

Break 9:00-9:15 AM

➤ Session I.1 (Room: Meyer) – 9:15 AM-10:30 PM
Internet of Things: Dr. Xubin He

a. iPand: Accurate Gesture Input with Ambient Acoustic Sensing on Hand: Shumin Cao, Peide Zhu, Xiang-Yang Li, Panlong Yang (University of Science and Technology of China, P.R. China); Xin He (University of Science and Technology of China & Anhui Normal University, P.R. China); Chen Mingshi (Army Engineering University, P.R. China)

b. A Graph Neural Network Based Efficient Firmware Information Extraction Method for IoT Devices: Weidong Zhang (Chinese Academy of Sciences, P.R. China); Hong Li, Limin Sun, Hongsong Zhu, Hui Wen (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

c. U-PoT: A Honeypot Framework for UPnP-Based IoT Devices: Muhammad Azizul Hakim, Hidayet Akso, Kemal Akkaya (Florida International University, USA); Selcuk Uluagac (Florida International University and Electrical and Computer Engineering, USA);

➤ Session I.3 (Room: Meyer) – 10:30 AM-12:15 PM
Online Social Networks: Dr. Selcuk Uluagac

a. Privacy Preserving Online Social Networks Using Enhanced Equicardinal Clustering: Madhuri Siddula, Zhipeng Cai, Dongjing Miao (Georgia State University, USA)

b. Classifying User Activities in the Encrypted WeChat Traffic: Chengshang Hou, Junzheng Shi, Cuicui Kang, Zigang Cao, Gang Xiong (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

c. Binoclt: A New Binomial Classification Scheme for Long-Text Mining in Online Social Network: Quanquan Chu, Shiyu Liu, Xiaofeng Gao, Fan Wu, Guihai Chen, Qianni Deng (Shanghai Jiao Tong University, P.R. China)

d. Socialite: Social Activity Mining and Friend Auto-labeling: Guangjing Wang, Lan Zhang, Zhi Yang, Xiang-Yang Li (University of Science and Technology of China, P.R. China)

Lunch (Room: Veranda) 12:15-1:30 PM (Lunch Tickets Must be Picked up at Registration)

➤ Session I.5 (Room: Meyer) – 1:30-3:30 PM
Cloud Computing II: Dr. Houbing Song

a. Cloud Resource Provisioning for Combined Stream and Batch Workflows: Raed Alsurdh, Bahman Javadi, Kenan Matawie, Rodrigo N. Calheiros (Western Sydney University, Australia)

b. A New Game Theoretic Scheme for Verifiable Cloud Computing: Pinglan Liu, Wensheng Zhang (Iowa State University, USA)

c. Utility-based Allocation of Industrial IoT Applications in Mobile Edge Clouds: Amardeep Mehta, Ewnetu Bayuh Lakew, Johan Tordsson (Umeå University, Sweden); Erik Elmroth (Umeå University and Elasticsys, Sweden)

d. Choosing the Best Server for a Data Center: The Importance of Workload Weighting: Sulav Malla, Ken Christensen (University of South Florida, USA)

e. QoS-Aware Matching of Edge Computing Services to Internet of Things: Nafiseh Sharghivand, Lena Mashayekhy (University of Delaware, USA); Farnaz Derakhshan (University of Tabriz, Iran)

Break 3:30-3:45 PM

➤ Session I.7 (Room: Meyer) – 3:45-5:45 PM
Big Data Processing & Analytics II: Dr. Lena Mashayekhy

a. Fountain Code Enabled ADS-B for Aviation Security and Safety Enhancement: Jian Wang, Yongxin Liu, Alfaiidi Amal, Houbing Song, Richard Stansbury, Jiawei Yuan, Tianyu Yang (Embry-Riddle Aeronautical University, USA)

b. Web Tracking Cartography with DNS Records: Jingxiu Su (University of Chinese Academy of Sciences & Institute of Computing Technology, P.R. China); Zhenyu Li, Gaogang Xie (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Stephane Grumbach (INRIA, France); Muhammad Ikram (Censored Planet University of Michigan, Australia & Macquarie University, USA); Kavé Salamati (LISTIC PolyTech, Université de Savoie Chambéry Annecy, France)

c. Oceanic Data Processing System Based on Multi-sensor Interaction Through Internet of Things: Jiachen Yang, Qiming Zhao, Chang Wang, Bin Jiang (Tianjin University, P.R. China); Tianyuan Zhang, Houbing Song (Embry-Riddle Aeronautical University, USA)

d. HyperProtect: Enhancing the Performance of a Dynamic Backup System Using Intelligent Scheduling: Yaobin Qin (University of Minnesota, USA); Brandon Hoffmann (University of Minnesota and Veritas Technologies, USA); David Lilja (ECE, University of Minnesota - Twin Cities, USA)

e. Fully Dynamic Broadcasting Under SINR: Yong Zhang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China); Dongxiao Yu (Shandong University, P.R. China); Jiguo Yu (Qufu Normal University, P.R. China); Qiang-Sheng Hua, Long Long Lin (Huazhong University of Science and Technology, P.R. China); Yifei Zou (The University of Hong Kong, Hong Kong); Xiuzhen Cheng (George Washington University, USA)

➤ Session I.2 (Room: Sunburst) – 9:15 AM-10:30 PM
Cloud Computing – I: Dr. Xinwen Fu

a. 2-Dominant Resource Fairness: Fairness-Efficiency Tradeoffs in Multi-resource Allocation: Suhan Jiang, Jie Wu (Temple University, USA)

b. A Fast Secure Outsourcing of Ridge Regression Based on Singular-Value Decomposition: Shuyi Zhang (University of Chinese Academy of Sciences and Institute of Information Engineering, P.R. China); Wei Wang, Qiongxiao Wang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Shiran Pan (Institute of Information Engineering, Chinese Academy of Sciences and School of Cyber Security, University of Chinese Academy of Sciences, P.R. China)

c. DeepSDN: Connecting the Dots Towards Self-driving Networks: Kuldeep Singh Atwal, Mostafa Bassiouni (University of Central Florida, USA)

➤ Session I.4 (Room: Sunburst) – 10:30 AM-12:15 PM
Security and Privacy: Dr. Honggang Zhang

a. Privacy Leakage in Smart Homes and Its Mitigation: IFTTT as a Case Study: Rixin Xu, Liehuang Zhu (Beijing Institute of Technology, P.R. China); Qiang Zeng (University of South Carolina, USA); Haotian Chi, Xiaojiang Du (Temple University, USA)

b. Location-leaking Through Network Traffic in Mobile Augmented Reality Applications: Gabriel Meyer-Lee (Swarthmore College, USA); Jiacheng Shang, Jie Wu (Temple University, USA)

c. URefFlow: A Unified Android Malware Detection Model Based on Reflective Calls: Chao Liu, Jianan Li, Min Yu, Kai Chen, Jianguo Jiang, Wei Qing Huang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Gang Li (Deakin University, Australia); Bo Luo (University of Kansas, USA)

d. A Novel Intrusion Detection Algorithm for Industrial Control Systems Based on CNN and Process State Transition: Junjiao Liu (University of Chinese Academy of Sciences, P.R. China); Libo Yin (National Industrial Information Security Development Research Center, P.R. China); Yan Hu (University of Science and Technology Beijing, P.R. China); Shichao Lv, Limin Sun (Institute of Information Engineering, China Academy of Science, Beijing, P.R. China)

Lunch (Room: Veranda) 12:15-1:30 PM (Lunch Tickets Must be Picked up at Registration)

➤ Session I.6 (Room: Sunburst) – 1:30-3:30 PM
Big Data Processing and Analytics I: Dr. Song Jiang

a. Software Rejuvenation in Computer Systems: An Automatic Forecasting Approach Based on Time Series: Paulo Pereira, Paulo Maciel (Federal University of Pernambuco, Brazil); Jean Carlos Teixeira de Araujo (Federal University of Pernambuco & Federal Rural University of Pernambuco, Brazil); Rubens S. Matos, Jr. (Federal Institute of Education, Science, and Technology of Sergipe, Brazil); Nuno Pregoça (FCT-UNL, Portugal)

b. Real-time Distributed-Random-Forest-Based Network Intrusion Detection System Using Apache Spark: Hao Zhang (National Engineering Research Center for E-Learning & Central China Normal University, P.R. China); Shumin Dai, Yong-dan Li, Wenjun Zhang (Central China Normal University, P.R. China)

c. FacGraph: Frequent Anomaly Correlation Graph Mining for Root Cause Diagnosis in Micro-Service Architecture: Weilan Lin, Meng Ma, Disheng Pan, Ping Wang (Peking University, P.R. China)

d. A Novel Method to Generate Frequent Itemsets in Distributed Environment: Jingyi Zheng, Xiaoheng Deng (Central South University, P.R. China); Honggang Zhang (University of Massachusetts Boston, USA)

e. When Group Buying Meets Wi-Fi Advertising: Yang Liu, Ying Zhang, Jianfeng Guan, Changqiao Xu (Beijing University of Posts and Telecommunications, P.R. China); Yu Wang (University of North Carolina at Charlotte, USA)

Break 3:30-3:45 PM

➤ Session I.8 (Room: Sunburst) – 3:45-5:45 PM
Cache, Memory & Disk Storage Systems I: Dr. JJ Garcia-Luna-Aceves

a. ThinDedup: An I/O Deduplication Scheme that Minimizes Efficiency Loss due to Metadata Writes: Fan Ni, Song Jiang (University of Texas, Arlington, USA); Xingbo Wu (University of Illinois at Chicago, USA); Weijun Li (Shenzhen Dapu Microelectronics Co. Ltd, P.R. China)

b. GAC: Gain-Aware 2-Round Cooperative Caching Approach in Information-Centric Networking: Jiang Zhi, Jun Li, Haibo Wu, Yongmao Ren (Computer Network Information Center, Chinese Academy of Sciences, P.R. China)

c. CoDE: Fast Name Lookup and Update using Conflict-driven Encoding: Tong Shen, Meng Yuanmei, Dafang Zhang (Hunan University, P.R. China); Gaogang Xie (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Xinyi Zhang (UCAS, P.R. China)

d. Crail-KV: A High-Performance Distributed Key-Value Store Leveraging Native KV-SSDs Over NVMe-oF: Timothy Bisson, Vijay Balakrishnan (Samsung, USA); Ke Chen (Samsung DSA, USA); Changho Choi (Samsung Semiconductors, USA); Yang-Suk Kee (UCSD, USA)

e. GD-FTL: Improving the Performance and Lifetime of TLC SSD by Downgrading Worn-out Blocks: Tianmin Yang (Huazhong University of Science and Technology, China)

IPCCC 2018 Day Two – Sunday, November 18

➤ Registration (Room: Meyer Lobby) 7:30-8:00 AM ➤ Welcome Chair: Xubin He (Room: Meyer) 7:45 AM

➤ Keynote II – 8:00-9:00 AM: Dr. Tao Li, Professor of Electrical and Computer Engineering, University of Florida
Enabling Efficient Computer Architectural & System Support for Next-Gen Deep Learning Applications

Break 9:00-9:15 AM

➤ Session 2.1 (Room: Meyer) – 9:15 AM-10:30 AM
Mobile Ad Hoc, Sensor & Mesh Networks I: Dr. Mihaela Cardei

a. Peer Data Caching Algorithms in Large-Scale High-Mobility Pervasive Edge Computing Environments: Yaodong Huang, Fan Ye, Yuanyuan Yang (Stony Brook University, USA)

b. Vehicle Delay-tolerant Network Routing Algorithm Based on Multi-period Bayesian Network: Hongyu Zhou, Lu Shen (Nanjing University of Posts and Telecommunications, P.R. China); Jiagao Wu (Nanjing University of Posts and Telecommunications & University of Victoria, P.R. China); Linfeng Liu (Hohai University & Nanjing University of Posts and Telecommunications, P.R. China)

c. Implementing Correct and Efficient Collision Avoidance in Multi-Hop Ad-Hoc Networks: JJ Garcia-Luna-Aceves (University of California at Santa Cruz & Palo Alto Research Center, USA)

➤ Session 2.2 (Room: Sunburst) – 9:15 AM-10:30 AM
Cache, Memory & Disk Storage Systems II: Dr. Diwakar Krishnamurthy

a. 3D-PIM NoCs with Multiple Subnetworks: A Performance and Power Evaluation: Abdel-Hameed A Badawy, Jesus Gardea, Yuho Jin, Jonathan Cook (New Mexico State University, USA)

b. A Road-Aware Spatial Mapping for Moving Objects: Xingsheng Zhao, Fan Ni, Song Jiang (University of Texas at Arlington, USA); Jingwen Shi, Yang Wang (Shenzhen Institutes of Advanced Technology, P.R. China); Mingzhe Du (Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, P.R. China)

c. Efficient Allocation and Heterogeneous Composition of NVM Crossbar Arrays for Deep Learning Acceleration: Hao Yan, Armin Haj Aboutalebi, Lide Duan (University of Texas at San Antonio, USA)

➤ Session 2.3 (Room: Meyer) – 10:30 AM-12:15 PM
Mobile Ad Hoc, Sensor & Mesh Networks II: Dr. Yu Wang

a. On the Impact of Sweep Radius and Energy Limitation on Sweep Coverage in Wireless Sensor Networks: Baihong Chen, Hongwei Du, Chuang Liu (Harbin Institute of Technology Shenzhen Graduate School, P.R. China); Qiang Ye (University of Prince Edward Island, Canada)

b. UAV-enabled Data Gathering in Wireless Sensor Networks: Ionut Cardei, Mihaela Cardei, Rafael Papa (Florida Atlantic University, USA)

c. Data Exchange in Delay Tolerant Networks Using Joint Inter- and Intra-Flow Network Coding: Pouya Ostovari (Temple University & Computer and Information Sciences, USA); Jie Wu (Temple University, USA); Alireza Jolfaei (Federation University Australia, Australia)

d. An Optimal LTE-U Access Method for Throughput Maximization and Fairness Assurance: Qian Wang, Zhipeng Gao (Beijing University of Posts and Telecommunications, P.R. China); Xiaojiang Du (Temple University, USA); Liehuang Zhu (Beijing Institute of Technology, P.R. China)

Lunch (Room: Veranda) 12:15 - 1:30 PM (Lunch Tickets Must be Picked up at Registration)

➤ Session 2.4 (Room: Sunburst) – 10:30 AM-12:15 PM
Performance Evaluation & Modeling: Dr. Lide Duan

a. Performance and Stability of Application Placement in Mobile Edge Computing System: Zhi Cao, Honggang Zhang (University of Massachusetts Boston, USA); Benyuan Liu (University of Massachusetts Lowell, USA)

b. A Game-theoretic Framework for Revenue Sharing in Edge-Cloud Computing System: Zhi Cao, Honggang Zhang, Bo Sheng (University of Massachusetts Boston, USA); Benyuan Liu (University of Massachusetts Lowell, USA)

c. S5: An Application Sensitive QoS Assurance System via SDN: Lei Wang, Lu Liu, Yong Jiang (Graduate School at Shenzhen, Tsinghua University, P.R. China); Qing Li (Southern University of Science and Technology, P.R. China); Mingwei Xu, Jianping Wu (Tsinghua University, P.R. China)

d. Reliability and Performance Analysis of a Data Center's Network Architecture: Walid Mokhtar Bennaceur (University of Versailles, France); Leila Kloul (UVSQ, France)

Lunch (Room: Veranda) 12:15 - 1:30 PM (Lunch Tickets Must be Picked up at Registration)

➤ Session 2.5 (Room: Meyer) – 1:30-3:30 PM
Crowdsourcing Systems: Dr. Benyuan Liu

a. Participant Grouping for Privacy Preservation in Mobile Crowdsensing over Hierarchical Edge Clouds: Ting Li, Lijuan Cao, Xinghua Shi, Yu Wang (University of North Carolina at Charlotte, USA); Zhijian Qiu (Qilu University of Technology - Shandong Academy of Sciences, P.R. China); Fan Li (Beijing Institute of Technology, P.R. China); Zhongwen Guo (Ocean University of China, P.R. China)

b. Budget-feasible User Recruitment in Mobile Crowdsensing with User Mobility Prediction: Wenjie Yang, Guodong Sun, Xiaoyue Zhang (Beijing Forestry University, P.R. China); Xingjian Ding (Renmin University of China, P.R. China)

c. Towards Optimized Online Task Allocation in Cost-Sensitive Crowdsensing Applications: Yang Zhang, Daniel Zhang, Qi Li, Dong Wang (University of Notre Dame, USA)

d. Quality-Aware Task Assignment in Opportunistic Network-based Crowdsourcing: Shohei Karaguchi, Kazuya Sakai, Satoshi Fukumoto (Tokyo Metropolitan University, Japan)

e. Towards Incentive Mechanism for Taxi Services Allocation with Privacy Guarantee: Donghe Li, Qingyu Yang, Dou An (Xi'an Jiaotong University, P.R. China); Wei Yu (Towson University, USA); Xinwen Fu (University of Central Florida, USA)

Break 3:30-3:45 PM

➤ Session 2.7 (Room: Meyer) – 3:45-5:45 PM
Network Protocols: Dr. Ningfang Mi

a. Adaptive Video Encoding and Dynamic Channel Access for Real-time Streaming over SDRs: Debashri Roy, Mainak Chatterjee (University of Central Florida, USA); Tathagata Mukherjee (Intelligent Robotics Inc., USA); Eduardo L Pasillio, Jr. (Air Force Research Laboratory, USA)

b. Coda: Achieving Multipath Data Transmission in NDN: Dongbiao He, Jinlei Jiang, Guangwen Yang (Tsinghua University, P.R. China); Cedric Westphal (Huawei Innovation Center, USA)

c. How to Set Timeout: Achieving Adaptive Load Balance in Asymmetric Topology Based on Flowlet Switching: Zhiqiang Guo, Xiaodong Dong, Sheng Chen, Xiaobo Zhou, Keqiu Li (Tianjin University, P.R. China)

d. BFRP: Endpoint Congestion Avoidance Through Bilateral Flow Reservation: Tianye Yang, Cunlu Li, Liqun Xiao (National University of Defense Technology, P.R. China); Dezun Dong (National University of Defense Technology & Hong Kong University of Science and Technology, P.R. China)

➤ Session 2.6 (Room: Sunburst) – 1:30-3:30 PM
Multimedia Networking: Dr. Wen-Zhan Song

a. The Frame Latency of Personalized Livestreaming Can Be Significantly Slowed Down by WiFi: Guoshun Nan, Xiuquan Qiao (Beijing University of Posts and Telecommunications, P.R. China); Jiting Wang, Zeyan Li, Jiahao Bu, Dan Pei (Tsinghua University, P.R. China); Mengyu Zhou (Microsoft Research, P.R. China); Pei Changhua (Alibaba Group, P.R. China)

b. Stride: Distributed Video Transcoding in Spark: Sajad Sameti, Mea Wang, Diwakar Krishnamurthy (University of Calgary, Canada)

c. Intelligent Optimization-Based Energy-Efficient Networking in Cloud Services for Multimedia Big Data: Dingde Jiang, Yihang Zhang (University of Electronic Science and Technology of China, P.R. China); Houbing Song (Embry-Riddle Aeronautical University, USA); Wenjuan Wang (Northeastern University, P.R. China)

d. Integrated Bandwidth Variation Pattern Differentiation for HTTP Adaptive Streaming over 4G Cellular Networks: Haipeng Du, Weizhan Zhang, Qinghua Zheng, Xuanyu Wang (Xi'an Jiaotong University, P.R. China)

e. Learning-based Cooperative Sound Event Detection with Edge Computing: Jingrong Wang, George Tzanetakis, Jianping Pan (University of Victoria, Canada); Kaiyang Liu (Computer Science, University of Victoria, Canada)

Break 3:30-3:45 PM

➤ Session 2.8 (Room: Sunburst) – 3:45-5:45 PM
Network Data Mining: Dr. Yingshu Li

a. Imaging Subsurface Civil Infrastructure with Smart Seismic Network: Maria Valero, Fangyu Li, Wen-Zhan Song (University of Georgia, USA); Xiang-Yang Li (University of Science and Technology of China, P.R. China)

b. Robust and Unsupervised KPI Anomaly Detection Based on Conditional Variational Autoencoder: Zeyan Li, Wenxiao Chen, Dan Pei (Tsinghua University, P.R. China)

c. Where You Really Are: User Trip Based City Functional Zone Ascertainment: Jiayu Gan, Jianhui Zhang, Siwen Zheng (Hangzhou Dianzi University, P.R. China)

d. Rapid Deployment of Anomaly Detection Models for Large Number of Emerging KPI Streams: Jiahao Bu, Ying Liu, Weibin Meng, Dan Pei (Tsinghua University, P.R. China); Shenglin Zhang (Nankai University, P.R. China); Qitong Liu, Xiaotian Zhu (Tencent, P.R. China)

Workshop Program – Monday, November 19

IPCCC 2018 Special Session:

Computing and Communications from IOTs to Data-Centric Systems

> Opening Remarks (Room: Meyer) 8:15-8:30 AM

> Session 3.1: (Room: Meyer) 8:30-10:00 AM

CPS3.1: Abdel-Hameed A Badawy

S3.1.1 AutoRARE: An Automated Tool For Generating FPGA-Based Multi-Memory Hardware Accelerators For Compute-Intensive Applications: Shrikant S Jadhav (North Carolina A&T State University, USA); Clay Gloster (North Carolina A&T State University, USA); Christopher Doss (North Carolina A&T State University, USA); Youngsoo Kim (San Jose State University, USA); Jannatun Naher (North Carolina A&T State University, USA)

S3.1.2 OC-Cache: An Open-Channel SSD Based Cache for Multi-Tenant Systems: Haitao Wang (Northwestern Polytechnical University, P.R. China); Zhanhuai Li (Northwestern Polytechnical University, P.R. China); Xiao Zhang (NorthWest Polytechnical University, P.R. China); Xiaonan Zhao (Northwestern Polytechnical University, P.R. China); Xingsheng Zhao (University of Texas at Arlington, USA); Weijun Li (Shenzhen Dapu Microelectronics Co. Ltd, P.R. China); Song Jiang (University of Texas, Arlington, USA)

S3.1.3 Friendly-Jamming-Aware Routing Protocols for Tactical Networks: Jonghyun Kim (Cloudamize, Inc, USA); Stephan Bohacek (University of Delaware, USA); Pratik Biswas (Epic Scientific, USA); Siamak Samoohi (US Army CEDEC, USA); Sharon Mackey (CERDEC Space & Terrestrial Communications Directorate, USA); Mitesh Patel (US Army CERDEC STCD, USA)

S3.1.4 Forwarding and Optical Indices in an All-Optical BCube Network: Suzhen Wang (The Chinese University of Hong Kong, P.R. China); Jingjing Luo (Harbin Institute of Technology, Shenzhen, P.R. China); Yuan-Hsun Lo (Xiamen University, P.R. China); Wing Shing Wong (The Chinese University of Hong Kong, P.R. China)

> Break 10:00-10:15 AM

> Session 3.2: (Room: Meyer) 10:15-11:45 AM

CPS3.2: Abdel-Hameed A Badawy

S3.2.1 Discover and Secure (DaS): An Automated Virtual Machine Security Management Framework: Beaulah A Navamani (University of Colorado, Colorado Springs, USA); Chuan Yue (Colorado School of Mines, USA); Xiaobo Zhou (University of Colorado, Colorado Springs, USA)

S3.2.2 Decouple and Stretch: A Boost to Channel Pruning: Zhen Chen (University of Science and Technology of China, P.R. China); Jianxin Lin (University of Science and Technology of China, P.R. China); Sen Liu (University of Science and Technology of China, P.R. China); Jun Xia (Jiangnan University, P.R. China); Weiping Li (University of Science and Technology of China, P.R. China)

S3.2.3 A Cache Based DoS Attack on Real Information Centric Networking System: Faustina Jeroma Anto Morais (University of North Florida, USA); Swapnoneel Roy (University of North Florida, USA); Sanjay Ahuja (University of North Florida, USA)

S3.2.4 Availability-Aware Container Scheduler for Application Services in Cloud: Yanal Alahmad (Concordia University, Canada); Tariq Daradkeh (Concordia University, Canada); Anjali Agarwal (Concordia University, Canada)

S3.2.5 Privacy-Preserving ECG based Active Authentication (PPEA2) for IoT Devices: Ghanshyam Bhutra (Texas A&M University, USA); Amar A Rasheed (Georgia Southern University, USA); Rabi Mahapatra (Texas A&M University, USA)

> Poster Program and Reception: Saturday Nov. 17 (Room: 20Seven) - 6:30-8:00 PM

Special thanks to the Technical Committee on Computer Communications (TCCC) for sponsoring this session

A Cost-effective and Energy-efficient Architecture for Die-stacked DRAM/NVM Memory Systems: Yuhua Guo and Weijun Xiao (Virginia Commonwealth University, USA); Qing Liu (New Jersey Institute of Technology, USA); Xubin He (Temple University, USA)

A Case-Based Decision System for Routing in Packet-Switched Networks: Zirui Zhuang, Jingyu Wang, Qi Qi, Haifeng Sun and Liao Jianxin (Beijing University of Posts and Telecommunications, P.R. China)

Network Embedding based on External Word Vectors: Xiaokun Zhang, Yan Liu and Jing Chen (Mathematical Engineering and Advanced Computing State Key Laboratory, P.R. China)

Cost Effective Test-bed for Comparison of SDN Network and Traditional Network: Adriana Collaguazo Jaramillo, Ronny Alcivar, Joffre Pesantez and Ronald Ponguillo (Escuela Superior Politécnica del Litoral, Ecuador)

EasyOrchestrator: A NFV-based Network Service Creation Platform for End-users: Yi Yue and Bo Cheng (Beijing University of Posts and Telecommunications, P.R. China)

A More Scalable Scheduling Algorithm for FPGA-based Time-Triggered Network: Yulong Zhan and Jihong Zhu (Tsinghua University, P.R. China)

Reversible Programming Techniques for Shortest-Path Algorithms: Lanying Guo, Chao Peng, Siyuan Chen and Cheng He (East China Normal University, P.R. China)

Centralized In-network Caching for Information Centric Networking with Decoupling Data and Control Planes: Sen Wang and Biao Zhang (Chongqing University, P.R. China)

An Effective Scheme to Utilize Caches for Streaming Services in Mobile CCN: Go Nakagawa and Yusuke Ito (University of Kitakyushu, Japan); Yurino Sato (National Institute of Technology, Sasebo College, Japan); Hiroyuki Koga (University of Kitakyushu, Japan)

On the Use of Q-Learning to Solve the Selectable Virtual Network Embedding Problem: Sen Wang and Biao Zhang (Chongqing University, P.R. China)

An Efficient Latch-free Database Index Based on Multi-dimensional Lists: Kenneth Lamar and Ramin Izadpanah (University of Central Florida, USA); Jim Brandt (Sandia National Laboratories, USA); Damian Dechev (University of Central Florida, USA)

A Deep Learning Based Framework for Cloud Masquerade Attack Detection: Shuting Xu and Shuhua Lai (Georgia Gwinnett College, USA); Yongjian Li (Institute of Software, Chinese Academy of Sciences, P.R. China)

HCACHE: A Hybrid Caching Strategy in Information-Centric Networking: Haibo Wu, Jun Li, Jiang Zhi, Yongmao Ren and Lingling Li (Computer Network Information Center, Chinese Academy of Sciences, P.R. China)

Dynamic Reservation and Deep Reinforcement Learning-based Autonomous Resource Management for Wireless Xiong Networks: Guolin Sun, Gebrekidan Tesfay Zemuy and Kun Xiong (University of Electronic Science and Technology of China, P.R. China)

Addressing the Challenges of the Internet of Things in a Highly Connected World

Dr. Kien A. Hua, Professor of Computer Science, University of Central Florida

Saturday, November 17, Room: Meyer 8:00 AM

Abstract:

The Internet of things (IoT) with 34 billion connected devices by 2020 will generate more 'big data' than ever. While Cloud Computing has been a viable solution for processing and analyzing very large volumes of data, dealing with billions of live data sources continuously feeding from all "corners" of the Internet would make it a serious bottleneck for IoT analytics in the cloud. In particular, on-demand video streaming already takes up 70% of Internet traffic. Non-stop streaming of IoT data will add substantially more stress on the Internet if IoT applications are not deployed responsibly.

In this presentation, we discuss potential solutions for this emerging challenge as video streaming and IoT streaming coalesce. We re-examine conventional wisdom in network design and consider a new concept called traffic deduplication. We present a Deduplication Overlay Network (DON) that shows congestion can surprisingly be turned into advantage.

Another great IoT challenge is due to "thing" heterogeneity (i.e., the diversity of cameras and sensors) and a new computation model is needed for heterogeneous data stream processing. We discuss this capability in an IoT architecture based on a Boolean abstraction. A Boolean query-processing framework is also presented as a potential standard approach for applications to share IoT infrastructure. These features are part of ThingStore, an online ecosystem for development and deployment of IoT applications.

While an IoT environment fusing human and machine intelligence opens up a host of new opportunities, the human teams may be overwhelmed trying to keep up with massive amounts of real-time information. This calls for new communication and collaboration tools to enable the human teams to deal with information overload in real-time decision making. Tabletop, a virtual multimedia conferencing system, is one such environment to support teamwork in an IoT-enabled human-cyber workplace. The team members can not only share and discuss multimedia information, but also cooperate on IoT devices as they collaborate. A short video will be presented to demonstrate this Tabletop system.

Biography

Dr. Kien A. Hua is a Pegasus Professor and Director of the Data Systems Lab at the University of Central Florida. He was the Associate Dean for Research of the College of Engineering and Computer Science at UCF. Prior to joining the university, he was a Lead Architect at IBM Mid-Hudson Laboratory, where he led a team of senior engineers to develop a highly parallel computer system, the precursor to the highly successful commercial parallel computer known as SP2.

More recently, Prof. Hua was serving as a domain expert on spaceport technology at NASA. Prof. Hua received his B.S. in Computer Science, and M.S. and Ph.D. in Electrical Engineering, all from the University of Illinois at Urbana-Champaign, USA. His diverse expertise includes network and wireless communications, Internet of Things, machine learning, data analytics, image/video computing, medical imaging, mobile computing, sensor networks, spaceport technology, and intelligent transportation systems.

He has published widely with 14 papers recognized as best or top papers at conferences and a journal. Many of his research papers have had significant impacts. His paper on Chaining technique began the peer-to-peer data sharing and video streaming revolution. His Skyscraper Broadcasting, Patching, and Zigzag techniques have each been heavily cited in literature, and have inspired many commercial systems in use today.

Prof. Hua has served as a Conference Chair, an Associate Chair, and a Technical Program Committee Member of numerous international conferences, and on the editorial boards of several professional journals. More recently, he served as a General Co-Chair for the 2014 ACM Multimedia conference; and he is currently organizing the 2018 IEEE International Conference on Cloud Engineering (IC2E) and serving as a General Co-Chair. Prof. Hua is a Fellow of IEEE.

Enabling Efficient Computer Architectural and System Support for Next-Generation Deep Learning Applications

Dr. Tao Li, Professor of Electrical and Computer Engineering, University of Florida

Sunday, November 18, Room: Meyer - 8:00 AM

Abstract:

In recent years, the artificial intelligence (AI) techniques, represented by deep neural networks (DNN), have emerged as indispensable tools in many fields. Traditionally, due to its huge compute power and scalability, the cloud data center is often the best option for training and evaluating AI applications. With the increasing computing power and energy efficiency of mobile devices, there is a growing interest in performing AI applications on mobile platforms. As a result, we believe the next-generation AI applications are pervasive across all platforms, ranging from central cloud data center to edge-side wearable and mobile devices.

However, we observe several gaps that challenge the pervasive AI applications. First, the large size of such newly developed AI networks poses both throughput and energy challenges to the underlying processing hardware, which hinders ubiquitous deployment for many promising AI applications. Second, the traditional statically trained AI model in cloud data center could not efficiently handle the dynamic data in the real in-situ environments, which leads to low inference accuracy. Lastly, the training of AI models still involves extensive human efforts to collect and label the large-scale dataset, which becomes impractical in the big data era where raw data is largely un-labeled and un-categorized.

In this talk, I will present architecture and system support which enables next generation AI applications to become highly efficient and intelligent. I will first introduce Pervasive AI, a user satisfaction-aware deep learning inference framework, to provide the best user satisfaction when migrating AI-based applications from Cloud to all kinds of platforms. Next, I will describe In-situ AI, a novel-computing paradigm tailored to in-situ AI applications. Furthermore, to tackle the big data challenge and achieve real intelligent (support autonomous learning), I will introduce Unsupervised AI, an unsupervised GAN-based deep learning accelerator.

Biography

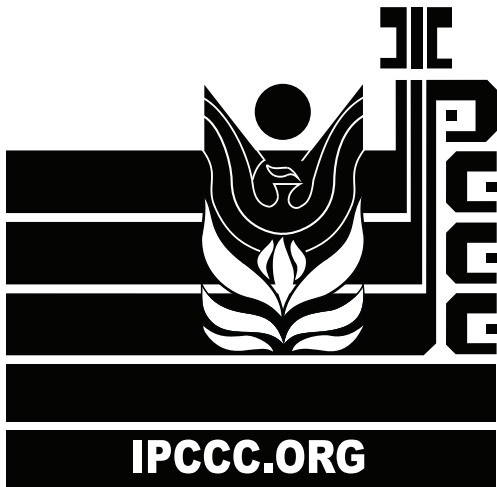
Dr. Tao Li is a full professor (with preeminence professorship) in the Department of Electrical and Computer Engineering at the University of Florida. He received a Ph.D. in Computer Engineering from the University of Texas at Austin. His research interests include computer architecture, microprocessor/memory/storage system design, virtualization technologies, energy-efficient/sustainable/dependable data center, cloud/big data computing platforms, the impacts of emerging technologies/applications on computing, and evaluation of computer systems.

Dr. Li received the 2009 National Science Foundation Faculty Early CAREER Award, 2008, 2007, 2006 IBM Faculty Awards, 2008 Microsoft Research Safe and Scalable Multi-core Computing Award and the 2006 Microsoft Research Trustworthy Computing Curriculum Award.

Dr. Li co-authored two papers that won the Best Paper Awards in ICCD 2016, HPCA 2011 and seven papers that were nominated for the Best Paper Awards in HPCA 2018, HPCA 2017, ICPP 2015, CGO 2014, DSN 2011, MICRO 2008 and MASCOTS 2006.

Dr. Li is one of the College of Engineering winners, University of Florida Doctor Dissertation Advisor/Mentoring Award for 2013-2014 and 2011-2012.

Dr. Li served as a CISE program director in the National Science Foundation (NSF) during 2015-2017, directing the national research agenda in computer and system architecture, including core programs for Software and Hardware Foundation (SHF), Exploiting Parallelism and Scalability (XPS), Scalable Parallelism in the Extreme (SPX), CISE Research Infrastructure (CRI), Faculty Early CAREER Development (CAREER), CISE Research Initiation Initiative (CRII), and Expeditions in Computing (EIC) programs. Dr. Li is an IEEE Fellow.



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