



The Third ACM/IEEE Symposium on Edge Computing

SEC 2018 Program at a Glance

THURSDAY, OCTOBER 25 (Auditorium)	
08:00 – 08:50	Breakfast (Foyer of Auditorium/Maple)
08:50 – 09:00	Opening Remarks and Awards
09:00 – 10:00	Keynote Speech 1
10:00 – 10:40	Coffee break (Auditorium Foyer)
10:40 – 12:00	Session I - Supporting Edge Applications
12:00 – 13:00	Lunch (Regency Ballroom D, E, F, G)
13:00 – 14:00	Panel
14:00 – 15:20	Session II – Privacy and Security
15:20 – 15:40	Coffee break (Auditorium Foyer)
15:40 – 17:00	Session III – Video at the Edge
17:00 – 18:30	Poster Session (Juniper and Larch)
18:30 – 20:30	Banquet and Awards (Regency Ballroom D, E, F, G)

FRIDAY, OCTOBER 26 (Auditorium)	
08:00 – 08:50	Breakfast (Foyer of Auditorium/Maple)
08:50 – 10:00	Keynote Speech 2
10:00 – 10:40	Coffee break (Auditorium Foyer)
10:40 – 12:00	Session IV – Edge Computing and IoT
12:00 – 13:00	Lunch (Regency Ballroom D, E, F, G)
13:00 – 14:20	Session V – Infrastructure and Placement
14:20 – 14:50	Coffee break (Auditorium Foyer)
14:50 – 15:50	Session VI – Edge-Cloud Interactions
16:00 – 17:45	Ph.D. Forum

SATURDAY, OCTOBER 27					
ArchEdge (Auditorium)		EdgeSP (Juniper)		HotWoT (Juniper)	
09:00 – 10:00	Keynote Speech 3 (Auditorium)				
8:45 – 17:10	Session	13:00 – 17:00	Session	10:05 – 11:45	Session

SEC 2018 Technical Program

THURSDAY, OCTOBER 25 (Auditorium)									
08:00 – 08:50	Breakfast (Foyer of Auditorium/Maple)								
08:50 – 09:00	Opening Remarks and Awards Victor Bahl, Jason Flinn, Weisong Shi, Dinesh Verma								
09:00 – 10:00	Keynote Speech 1 (session chair: Weisong Shi) Kenneth L. Calvert (<i>Division Director of CNS, NSF</i>)								
10:00 – 10:40	Coffee break (Auditorium Foyer)								
10:40 – 12:00	Session I - Supporting Edge Applications Session chair: Mahadev Satyanarayanan								
	<table border="1"> <tr> <td>MUVR: Supporting Multi-User Mobile Virtual Reality with Resource Constrained Edge Cloud</td> <td><i>Yong Li (University of Tennessee, Knoxville); Wei Gao (University of Pittsburgh)</i></td> </tr> <tr> <td>SafeShareRide: Edge-based Attack Detection in Ridesharing Services</td> <td><i>Liangkai Liu, Xingzhou Zhang (Wayne State University); Mu Qiao (IBM Research-Almaden); Weisong Shi (Wayne State University)</i></td> </tr> <tr> <td>CAVBench: The Benchmark Suite for Connected and Autonomous Vehicles</td> <td><i>Yifan Wang (SKL of Computer Architecture, Institute of Computing Technology, CAS); Shaoshan Liu (PerceptIn); Xiaopei Wu, Weisong Shi (Wayne State University)</i></td> </tr> <tr> <td>QoE Inference and Improvement Without End-Host Control</td> <td><i>Ashkan Nikravesh, Qi Alfred Chen (University of Michigan); Scott Haseley (University of Illinois); Xiao Zhu (University of Michigan); Geoffrey Challen (University of Illinois); Z. Morley Mao (University of Michigan)</i></td> </tr> </table>	MUVR: Supporting Multi-User Mobile Virtual Reality with Resource Constrained Edge Cloud	<i>Yong Li (University of Tennessee, Knoxville); Wei Gao (University of Pittsburgh)</i>	SafeShareRide: Edge-based Attack Detection in Ridesharing Services	<i>Liangkai Liu, Xingzhou Zhang (Wayne State University); Mu Qiao (IBM Research-Almaden); Weisong Shi (Wayne State University)</i>	CAVBench: The Benchmark Suite for Connected and Autonomous Vehicles	<i>Yifan Wang (SKL of Computer Architecture, Institute of Computing Technology, CAS); Shaoshan Liu (PerceptIn); Xiaopei Wu, Weisong Shi (Wayne State University)</i>	QoE Inference and Improvement Without End-Host Control	<i>Ashkan Nikravesh, Qi Alfred Chen (University of Michigan); Scott Haseley (University of Illinois); Xiao Zhu (University of Michigan); Geoffrey Challen (University of Illinois); Z. Morley Mao (University of Michigan)</i>
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11:30 – 13:00	Lunch (Regency Ballroom D, E, F, G)								
13:00 – 14:00	<p>Panel: Insights from the applied edge Moderator: J. Chris Ramming <i>(Senior Director of Research & Innovation, VMware Inc.)</i></p> <p>Panelists: Greg Bollella <i>(CTO, Internet-of-Things, VMware, Inc.)</i> Xingang Guo <i>(General Manager, IoT for Amazon Delivery Logistics)</i> Eve Schooler <i>(Director, Intel)</i> Guijun Wang <i>(Technical Fellow, Boeing)</i> Lei Zhong <i>(Senior Researcher, Toyota ITC)</i></p>								

14:00 – 15:20	Session II – Privacy and Security Session chair: Robin Kravets	
	HomePad: A Privacy-aware Smart Hub for Home Environments	<i>Igor Zavalayshyn (IST, University of Lisbon); Nuno O. Duarte (MPI-SWS); Nuno Santos (IST, University of Lisbon)</i>
	Vigilia: Securing Smart Home Edge Computing	<i>Rahmadi Trimananda, Ali Younis, Bojun Wang, Bin Xu, Brian Demsky, Guoqing (Harry) Xu (University of California, Irvine)</i>
	Learning from Differentially Private Neural Activations with Edge Computing	<i>Yunlong Mao (Nanjing University); Shanhe Yi, Qun Li (College of William & Mary); Jinghao Feng, Fengyuan Xu, Sheng Zhong (Nanjing University)</i>
	Harpocrates: Giving Out Your Secrets and Keeping Them Too	<i>Rufaida Ahmed, Zirak Zaheer, Richard Li, Robert Ricci (University of Utah)</i>
15:20 – 15:40	Coffee break (Auditorium Foyer)	
15:40 – 17:00	Session III – Video at the Edge Session chair: Landon Cox	
	VideoEdge: Processing Camera Streams using Hierarchical Clusters	<i>Chien-Chun Hung (USC/MSR); Ganesh Ananthanarayanan, Peter Bodik (MSR); Leana Golubchik (USC); Minlan Yu (Harvard); Paramvir Bahl, Matthai Philipose (MSR)</i>
	Application-aware IoT Camera Virtualization for Video Analytics Edge Computing	<i>Si Young Jang, Yoonhyung Lee, Byoungheon Shin, Dongman Lee (KAIST); Dionisio Vendrell Jacinto (Technical University of Munich)</i>
	Edge-based Discovery of Training Data for Machine Learning	<i>Ziqiang Feng, Shilpa George, Jan Harkes (Carnegie Mellon University); Padmanabhan Pillai (Intel Labs); Roberta Klatzky, Mahadev Satyanarayanan (Carnegie Mellon University)</i>
	Bandwidth-efficient Live Video Analytics for Drones via Edge Computing	<i>Junjue Wang, Ziqiang Feng, Zhuo Chen, Shilpa George (Carnegie Mellon University); Mihir Bala (University of Michigan); Padmanabhan Pillai, Shao-Wen Yang (Intel Labs); Mahadev Satyanarayanan (Carnegie Mellon University)</i>
17:00 – 18:30	Poster Session (Juniper and Larch)	
18:30 – 20:30	Banquet and Awards (Regency Ballroom D, E, F, G) SIGMOBILE IoT Award Presentation (Mahadev Satyanarayanan: “Pervasive Computing: Vision and Challenges”) Fellow Ceremony Best Paper Award	

FRIDAY, OCTOBER 26 (Auditorium)		
08:00 – 08:50	Breakfast (Foyer of Auditorium/Maple)	
08:50 – 10:00	Keynote Speech 2 (session chair: Victor Bahl) Arjmand Samuel <i>(Principal Program Manager, Microsoft Azure Internet of Things)</i>	
10:00 – 10:40	Coffee break (Auditorium Foyer)	
10:40 – 12:00	Session IV – Edge Computing and IoT Session chair: Ganesh Ananthanarayanan	
	Aggio: A Coupon Safe for Privacy-Preserving Smart Retail Environments	<i>Albert F Harris III, Robin Kravets (University of Illinois at Urbana-Champaign); Robin Snader (Athetized Networks)</i>
	From Cell Towers to Smart Street Lamps: Placing Cloudlets on Existing Urban Infrastructures	<i>Julien Gedeon, Michael Stein, Jeff Krisztinkovics (Technische Universität Darmstadt); Patrick Felka, Katharina Keller (Goethe-Universität Frankfurt am Main); Christian Meurisch, Lin Wang, Max Mühlhäuser (Technische Universität Darmstadt)</i>
	In-Situ Resource Provisioning with Adaptive Scale-out for Regional IoT Services	<i>Yugo Nakamura, Teruhiro Mizumoto, Hirohiko Suwa, Yutaka Arakawa (Nara Institute of Science and Technology); Hirozumi Yamaguchi (Osaka University); Keiichi Yasumoto (Nara Institute of Science and Technology)</i>
	Scalable Edge Computing Architectures for Low Latency Data Dissemination in Topic-based Publish/Subscribe	<i>Shweta Khare, Hongyang Sun (Vanderbilt University); Kaiwen Zhang (Ecole de Technologie Supérieure); Julien Gascon-Samson (University of British Columbia); Aniruddha Gokhale, Xenofon Koutsoukos (Vanderbilt University)</i>
12:00 – 13:00	Lunch (Regency Ballroom D, E, F, G)	
13:00 – 14:20	Session V – Infrastructure and Placement Session Chair: Padmanabhan Pillai	
	Dependency Mining for Service Resilience at the Edge	<i>Atakan Aral, Ivona Brandic (Vienna University of Technology)</i>
	Cooperative-Competitive Task Allocation in Edge Computing for Delay-Sensitive Social Sensing	<i>Daniel Zhang, Yue Ma, Chao Zheng, Yang Zhang, X. Sharon Hu, Dong Wang (University of Notre Dame)</i>
	Portable Energy-Aware Cluster-Based Edge Computers	<i>Thomas Rausch, Cosmin Avasalcari, Schahram Dustdar (TU Wien)</i>

	F-MStorm: Feedback-based Online Distributed Mobile Stream Processing	<i>Mengyuan Chao, Chen Yang, Yukun Zeng, Radu Stoleru (Texas A&M University)</i>
14:20 – 14:50	Coffee break (Auditorium Foyer)	
14:50 – 15:50	Session VI – Edge-Cloud Interactions Session chair: Kiryong Ha	
	Scalability and Performance Evaluation of Edge Cloud Systems for Latency Constrained Applications	<i>Sumit Maheshwari, Dipankar Raychaudhuri, Ivan Seskar (WINLAB, Rutgers University); Francesco Bronzino (INRIA, France)</i>
	Costless: Optimizing Cost of Serverless Computing through Function Fusion and Placement	<i>Tarek Elgamal, Atul Sandur, Klara Nahrstedt, Gul Agha (University of Illinois Urbana Champaign)</i>
	An Envy-Free Auction Mechanism for Resource Allocation in Edge Computing Systems	<i>Tayebah Bahreini, Hossein Badri, Daniel Grosu (Wayne State University)</i>
16:00 – 17:45	Ph.D. Forum	

Poster papers:

- 1. *Scaling on the Edge – A Benchmarking Suite for Human-in-the-Loop Applications***
Manuel Olguín (KTH Royal Institute of Technology, Sweden), Junjue Wang, Mahadev Satyanarayanan (Carnegie Mellon University), James Gross (KTH Royal Institute of Technology, Sweden)
- 2. *Managing Sensing Resources at the Edge using Cloud OSeS***
Lirim Osmani, Ashwin Rao, Samu Varjonen, Eemil Lagerspetz (University of Helsinki), Hannu Flinck (Nokia Bell Labs), Sasu Tarkoma (University of Helsinki)
- 3. *Risk-based Optimization of Resource Provisioning in Mobile Edge Computing***
Hossein Badri, Tayebah Bahreini, Daniel Grosu, Kai Yang (Wayne State University)
- 4. *FECBench: An Extensible Framework for Pinpointing Sources of Performance Interference in the Cloud-Edge Resource Spectrum***
Yogesh D. Barve, Shashank Shekhar, Ajay D. Chhokra, Shweta Khare, Anirban Bhattacharjee, Aniruddha Gokhale (Vanderbilt University)
- 5. *A Deep Neural Network Compression Algorithm Based on Knowledge Transfer for Edge Device***
Chao Li, Xiaolong Ma, Zhulin An, Yongjun Xu (Institute of Computing Technology Chinese Academy of Sciences)
- 6. *Smart Surveillance as an Edge Service for Real-Time Human Detection and Tracking***
Seyed Yahya Nikouei, Yu Chen, Timothy R. Faughnan (Binghamton University, SUNY)

- 7. *Towards a Distributed and Self-Adaptable Cloud-Edge Middleware***
Julien Gascon-Samson, Kumseok Jung, Karthik Pattabiraman (University of British Columbia)
- 8. *Embedded Deep Learning for Vehicular Edge Computing***
Jacob Hochstetler, Rahul Padidela, Qi Chen, Qing Yang, Song Fu (University of North Texas)
- 9. *Container-Based Architecture for Optimal Face-Recognition Tasks in Edge Computing***
Nadim Tellez, Miguel Jimeno, Augusto Salazar, Elias Nino-Ruiz (Universidad del Norte)
- 10. *DyCREM: Dynamic Credit Risk Management Using Edge-based Blockchain***
Youhuizi Li, Weisong Shi, Jun Chen (Wayne State University)
- 11. *EdgeBox: Live Edge Video Analytics for Near Real-Time Event Detection***
Bing Luo, Sheng Tan, Zhifeng Yu, Weisong Shi (Wayne State University)
- 12. *Mobile Edge Computing – a Booster for the Practical Provisioning Approach of Web-based Augmented Reality***
Pei Ren, Xiuquan Qiao, Junliang Chen (Beijing University of Posts and Telecommunications, China), Schahram Dustdar (TU Wien, Austria)
- 13. *Latency-Oblivious Incentive Service Offloading in Mobile Edge Computing***
Amit Samanta (India Institute of Technology, Kharagpur, India), Yong Li (Tsinghua University)
- 14. *A Heuristic Algorithm Based on Resource Requirements Forecasting for Server Placement in Edge Computing***
Kaile Xiao, Zhipeng Gao, Qian Wang, Yang Yang (Beijing University of Posts and Telecommunications, China)
- 15. *ThingsMigrate - Platform-Independent Live-Migration of JavaScript Processes***
Kumseok Jung, Julien Gascon-Samson, Karthik Pattabiraman (University of British Columbia)
- 16. *EdgeNet: A Global Cloud That Spreads by Local Action***
Justin Cappos (NYU), Matthew Hemmings, Rick McGeer (US Ignite), Albert Rafetseder (NYU), Glenn Ricart (US Ignite)

ArchEdge Program

SATURDAY, OCTOBER 27 (Auditorium)	
08:45 – 09:00	<p style="text-align: center;">Welcome Yiran Chen and Gabel Loh</p>
09:00 - 10:00	<p style="text-align: center;">Keynote Speech 3 (moderator: Gabel Loh, AMD) <i>Edge Intelligence: Convergence of Edge Compute and Machine Learning</i> Allen Rush (Senior Fellow, AMD)</p>
10:00 – 10:30	<p style="text-align: center;">Coffee break (3rd Floor Foyer)</p>
10:30 - 12:00	<p style="text-align: center;">Session I – System Challenges Session Chair: Yiran Chen (Duke University)</p>
	<p>An efficient cloud-edge framework for computer vision applications <i>Ehsan Mohyedin Kermani, Amin Banitalebi-Dehkordi, Yong Zhang, Yuri Mosieyenko, Lanjun Wang, and Jiebo Luo (Huawei Technologies, Canada)</i></p>
	<p>Systems challenges for augmented and virtual reality on the edge <i>Yuhao Zhu (University of Rochester)</i></p>
	<p>Amino - A distributed runtime for applications running dynamically across device, edge and cloud <i>Ying Xiong and Donghui Zhuo (Cloud Lab at Huawei R&D USA)</i></p>
12:00 – 13:30	<p style="text-align: center;">Lunch (Foyer of Auditorium/Maple)</p>
13:30 - 15:00	<p style="text-align: center;">Session II – Neural Networks and Machine Learning Session Chair: Xiang Chen (George Mason University)</p>
	<p>A neural network architecture for real-time facial attributes recognition on low-power edge devices <i>Amin Banitalebi-Dehkordi, Ehsan Mohyedin Kermani, Yuri Moiseyenko, Lanjun Wang, et al. (Huawei Technologies, Canada)</i></p>
	<p>Light-weight machine learning on IoT edge device <i>Xuan Qi and Chen Liu (Clarkson University)</i></p>
	<p>Optimizing deep neural network on FPGAs via efficient memory and computation mapping devices <i>Guoyang Chen (Alibaba Group US Inc.), Shiqiang Cui (Alibaba Group Inc.), Xiaoyong Liu (Alibaba Group US Inc.), and Weifeng Zhang (Alibaba Group US Inc.)</i></p>
15:00 – 15:30	<p style="text-align: center;">Coffee break (3rd Floor Foyer)</p>

15:30 - 17:00	<p align="center">Session III –Edge Applications Session Chair: Gabiel Loh (<i>AMD</i>)</p>
	<p>NFV at the edge, from system and architecture perspectives <i>Yang Hu (UT Dallas)</i></p>
	<p>Extend data center execution environment to edge with KubeEdge <i>Ying Xiong and Yulin Sun (Cloud Lab at Huawei R&D USA)</i></p>
	<p>Privacy partition: a privacy-preserving framework for deep neural networks in edge networks <i>Jianfeng Chi (University of Virginia), Emmanuel Owusu (Carnegie Mellon University), Xuwang Yin (University of Virginia), Tong Yu (Carnegie Mellon University), et al.</i></p>
17:00 – 17:10	<p align="center">Closing remarks Yiran Chen and Gabiel Loh</p>

HotWoT 2018 Program

SATURDAY, OCTOBER 27 (Juniper)	
09:00 - 10:00	<p>Keynote Speech 3 (moderator: Gabiel Loh, <i>AMD</i>) <i>Edge Intelligence: Convergence of Edge Compute and Machine Learning</i> Allen Rush <i>(Senior Fellow, AMD)</i> Location: Auditorium</p>
10:05 - 12:05	<p>Session</p>
	<p>EveryLite: A Lightweight Scripting Language for Micro Tasks in IoT Systems <i>Zhenying Li, Xiaohui Peng, Lu Chao and Zhiwei Xu (Institute of Computing Technology, Chinese Academy of Sciences)</i></p>
	<p>Defending Internet of Things Against Malicious Domain Names using D-FENS <i>Jeffrey Spaulding and Aziz Mohaisen (University of Central Florida)</i></p>
	<p>How Edge Computing and Initial Congestion Window Size Affect Latency of Web-based Services: Early Experiences with Baidu <i>Qingyang Zhang (Anhui University), Hong Zhong (Anhui Universty), Jiaoren Wu (Baidu Online Network Technology) and Weisong Shi (Wayne State Unversity)</i></p>
	<p>Stable Clustering for VANETs on Highways <i>Xiaolu Cheng (Virginia Commonwealth University), Baohua Huang (Guangxi University) and Wei Cheng (Virginia Commonwealth University)</i></p>
	<p>Enabling Semantics in oneM2M Service Delivery Platform <i>Jie Cao, Lanyu Xu and Weisong Shi (Wayne State University)</i></p>

EdgeSP Program

SATURDAY, OCTOBER 27 (Juniper)	
09:00 - 10:00	<p>Keynote Speech 3 (moderator: Gabiel Loh, <i>AMD</i>)</p> <p><i>Edge Intelligence: Convergence of Edge Compute and Machine Learning</i></p> <p>Allen Rush (<i>Senior Fellow, AMD</i>)</p> <p>Location: Auditorium</p>
13:00 - 17:00	<p>Session</p>
	<p>FastPay: A Secure Fast Payment Method for Edge-IoT Platforms using Blockchain</p> <p><i>Zijiang Hao, Raymond Ji and Qun Li</i></p>
	<p>A Novel Architecture for Automatic Document Classification for Effective Security in Edge Computing Environments</p> <p><i>Lei Ding and Malek Ben Salem</i></p>
	<p>Preliminary Study of Trusted Execution Environments on Heterogeneous Edge Platforms</p> <p><i>Zhenyu Ning, Jinghui Liao, Fengwei Zhang and Weisong Shi</i></p>
	<p>KLRA: A Kernel Level Resource Auditing Tool For IoT Operating System Security</p> <p><i>Dong Li, Zhaonian Zhang, Weiyuan Liao and Zhiwei Xu</i></p>
	<p>Lightweight Hardware Based Secure Authentication Scheme for Fog Computing</p> <p><i>Baiyi Huang, Xiuzhen Cheng, Yuan Cao and Le Zhang</i></p>
	<p>Secure Edge Computing in IoT Systems: Review and Case Studies</p> <p><i>Mohammed Alrowaily and Zhuo Lu</i></p>
	<p>Adge: An ADMM-Based Audio Adversarial Example Generation Method</p> <p><i>Fuxun Yu, Zirui Xu, Chenchen Liu, Yanzhi Wang, Xiang Chen</i></p>