

ACM CoNEXT

2019

International Conference on emerging Networking EXperiments and Technologies

December 9 - 12, 2019

Orlando, Florida

Venue: UCF FAIRWINDS Alumni Center
12676 Gemini Blvd N,
Orlando, FL, U.S.

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Monday, December 9

Student Workshop (Room 101A)

Opening Remarks (09:30 – 09:45)

Keynote Session (09:45 – 10:30)

Multi-Element Optical Wireless Modules for Mobile Networking and Lighting
Murat Yuksel (University of Central Florida)

Coffee Break (10:30 – 11:00)

Session I: Machine Learning for Networking (11:00 – 12:15)

When Network Slicing meets Deep Reinforcement Learning
Qiang Liu, Tao Han (University of North Carolina – Charlotte)

On the Learnability of Software Router Performance via CPU Measurements
Charles Shelbourne (University College London); Leonardo Linguaglossa (Telecom ParisTech); Aldo Lipani (University College London); Tianzhu Zhang (Telecom ParisTech); Fabien Geyer (Technical University Munich)

Adversarial Network Algorithm Benchmarking
Sebastian Lettner, Andreas Blenk (Technical University of Munich)

CLEO: Machine Learning for ECMP
Heesang Jin, Minkoo Kang, Gyeongsik Yang, Chuck Yoo (Korea University)

Towards more realistic network models based on Graph Neural Networks
Arnau Badia-Sampera, José Suárez-Varela, Paul Almasan, Krzysztof Rusek, Pere Barlet-Ros, Albert Cabellos-Aparicio (Barcelona Neural Networking Center, Universitat Politècnica de Catalunya)

Lunch (12:15 – 14:00)

Session II: Programmable Networks (14:00 – 14:30)

Ward: Implementing Arbitrary Hierarchical Policies using Packet Resubmit in Programmable Switches
Mojtaba Malekpourshahraki, Brent Stephens, Balajee Vamanan (UIC)

iLoad: In-network Load Balancing with Programmable Data Plane
Garegin Grigoryan (Rochester Institute of Technology); Yaoqing Liu (Fairleigh Dickinson University); Minseok Kwon (Rochester Institute of Technology)

Session III: Virtualization (14:30 – 15:15)

Exploiting content similarity to address cold start in container deployments
Kunal Mahajan (Columbia University); Saket Mahajan (Santa Clara University); Vishal Misra, Dan Rubenstein (Columbia University)

Dynamically Sharing Memory between Memcached Tenants using Tingo
AmirHossein Seyri (University of Illinois at Chicago); Abhisek Pan (Microsoft); Balajee Vamanan (University of Illinois at Chicago)

Network in the Air
Amir Varasteh, Wolfgang Kellerer, Carmen Mas Machuca (Technical University of Munich)

Coffee Break (15:15 – 15:45)

Session IV: Mobile and Wireless (15:45 – 16:30)

Asynchronous LOS Discovery Algorithm for Aerial Nodes Using In-band Full-Duplex Transceivers
A F M Saniul Haq (University of Central Florida); Mahmudur Khan (The University of Alabama); Murat Yuksel (University of Central Florida)

PKN: Improving Survivability of LEO Satellite Network through Protecting Key Nodes
Shaoqing Wang, Youjian Zhao, Hui Xie (Tsinghua University)

Mobility profiling: Identifying scouts in the crowd
Licia Amichi, Aline Viana (INRIA); Mark Crovella (Boston University); Antonio A. F. Loureiro (UFMG)

Session V: New Directions (16:30 – 17:00)

A first look into Alexa's interaction security
Ismael Castell-Uroz, Xavier Marrugat-Plaza, Josep Solé-Pareta, Pere Barlet-Ros (Universitat Politècnica de Catalunya)

Transparent Coded Blockchain
Li Quan, Qin Huang (Beihang University)

Workshop on Big Data, Machine Learning and AI for Data Communication Networks (Big-DAMA) (Room 101B)

Opening Remarks (09:15 – 09:30)

Keynote Session (09:30 – 10:30)

Challenges and Opportunities for AI Research in Networked Systems
Leonardo Linguaglossa (Télécom ParisTech)

Coffee Break (10:30 – 11:00)

Session I: AI/ML for Network Security and Intrusion Detection (11:00 – 12:30)

Identifying Threats in a Large Company's Inbox
Luigi Gallo, Alessio Botta, Giorgio Ventre (University of Napoli Federico II)

Walling up Backdoors in Intrusion Detection Systems
Maximilian Bachl, Alexander Hartl, Joachim Fabini, Tanja Zseby (TU Wien)

Towards Evaluation of NIDSs in Adversarial Setting
Mohammad J. Hashemi, Greg Cusack, Eric Keller (University of Colorado Boulder)

Lunch (12:30 – 14:00)

Session II: AI/ML for Network Traffic Analysis (14:00 – 15:00)

EXPLAIN-IT: Towards Explainable AI for Unsupervised Network Traffic Analysis
Andrea Morichetta (Politecnico di Torino), Pedro Casas (AIT Austrian Institute of Technology), Marco Mellia (Politecnico di Torino)

Explaining Class-of-Service Oriented Network Traffic Classification with Superfeatures
Sayantan Chowdhury, Ben Liang (University of Toronto), Ali Tizghadam (Technology Strategy and Business Transformation, TELUS)

Coffee Break (15:00 – 15:30)

Session III: AI/ML for Network Anomaly Detection (15:30 – 16:30)

Comparing Machine Learning Algorithms for BGP Anomaly Detection using Graph Features
Odnan Ref Sanchez (University of Strasbourg), Simone Ferlin (Ericsson), Cristel Pelsser (University of Strasbourg), Randy Bush (IIJ)

Unsupervised Machine Learning for Network-centric Anomaly Detection in IoT
Randeep Bhatia, Steven Benno, Jairo Esteban, T. V. Lakshman (Bell Labs, Nokia), John Grogan (C Spire)

Wrap-up and Closing (16:30 – 17:00)

Workshop on Emerging in-Network Computing Paradigms (ENCP) (Room 101C)

Opening Remarks (09:00 – 09:20)

Keynote Session (09:20 – 10:20)

Huge Workflows for Data Intensive Science and the Impact on Networking
Deep Medhi (National Science Foundation)

Coffee Break (10:20 – 11:00)

Session I: Network programmability (Part #1) (11:00 – 12:15)

Online Reprogrammable Multi Tenant Switches

Johannes Krude (RWTH Aachen University); Jaco Hofmann, Matthias Eichholz (Technische Universität Darmstadt); Klaus Wehrle (RWTH Aachen University); Andreas Koch, Mira Mezini (Technische Universität Darmstadt)

Offloading Virtual Evolved Packet Gateway User Plane Functions to a Programmable ASIC

Suneet Kumar Singh, Christian Esteve Rothenberg (University of Campinas); Gyanesh Patra, Gergely Pongracz (Ericsson Research)

Towards Executing Computer Vision Functionality on Programmable Network Devices

René Glebke, Johannes Krude, Ike Kunze, Jan Rüdth, Felix Senger, Klaus Wehrle (RWTH Aachen University)

Lunch (12:15 – 14:00)

Session I: Network programmability (Part #2) (14:00 – 14:50)

P4-InTel: Bridging the Gap between iCF Diagnosis and Functionality

Lucas Castanheira, Alberto E. Schaeffer-Filho (Federal University of Rio Grande do Sul (UFRGS)); Theophilus A. Benson (Brown University)

Partition-Aware Packet Steering Using XDP and eBPF for Improving Application-Level Parallelism

Pekka Enberg, Ashwin Rao, Sasu Tarkoma (University of Helsinki)

Session II: In-network computing architectures and protocols (Part #1)

(14:50 – 15:15)

Execution Plans for Serverless Computing in Information Centric Networking

Christopher Scherb, Claudio Marxer, Christian Tschudin (University of Basel, Switzerland)

Coffee Break (15:15 – 15:45)

Session II: In-network computing architectures and protocols (Part #2)

(15:45 – 17:00)

Edge Data Repositories - The design of a store-process-send system at the Edge

Adrian-Cristian Nicolaescu, Ioannis Psaras, Onur Ascigil (University College London)

Trigger-Action Computing in Local Broadcast Beaconing Networks

Teemu Kärkkäinen, L. Fuchsloch, Jörg Ott (Technical University of Munich)

An Architecture for In-Network Computing

Abdulazaz Ali Albalawi (UC Santa Cruz); Asit Chakraborti, Cedric Westphal (Futurewei); Dirk Kutscher (Emden University); Jeffrey He (Huawei); Quinton Hoole (Futurewei)

Conclusion Remarks and Awards (17:00 – 17:15)

ACM CoNEXT 2019 – Technical Program

Tuesday, December 10

Opening Remarks (Room 101A-101B) (09:00 – 09:30)

Keynote Session (09:30 – 10:30)

Riding along with the Time-Traveling Networking Researcher
Mostafa H. Ammar (Georgia Institute of Technology)

Coffee Break (10:30 – 11:00)

Session 1: Programmable Networks (Room 101A-101B) (11:00 – 12:30)

Session chair: Craig Patridge (Colorado State University)

PURR: A Primitive for Reconfigurable Fast Reroute

Marco Chiesa (KTH Royal Institute of Technology); Roshan Sedar (Independent Researcher); Gianni Antichi (Queen Mary, University of London); Michael Borokhovich (Independent Researcher); Andrzej Kamisiński (AGH University of Science and Technology in Kraków); Georgios Nikolaidis (Barefoot Networks); Stefan Schmid (University of Vienna)

Fine-Grained Queue Measurement in the Data Plane

Xiaoqi Chen, Shir Landau-Feibish (Princeton University); Yaron Koral (AT&T Labs); Jennifer Rexford (Princeton University); Ori Rottenstreich (Technion); Steven A Monetti, Tzuu-Yi Wang (AT&T Labs)

HyperTester: High-performance Network Testing Driven by Programmable Switches

Yu Zhou, Zhaowei Xi, Dai Zhang, Yangyang Wang, Jinqiu Wang, Mingwei Xu, Jianping Wu (Tsinghua University)

Normal Forms for Match-Action Programs

Felicián Németh (Budapest University of Technology and Economics); Marco Chiesa (KTH Royal Institute of Technology); Gábor Rétvári (Budapest University of Technology and Economics)

Lunch (Room 109) (12:30 – 14:00)

N2Women Workshop (Room 101C) (12:30 – 14:00)

Session: Deployment (Room 101A-101B) (14:00 – 15:15)

Session chair: Marinho Barcellos (University of Waikato)

PEERING: Virtualizing BGP at the Edge for Research

Brandon Schlinker (University of Southern California); Todd Arnold (Columbia University); Italo Cunha (Universidade Federal de Minas Gerais); Ethan Katz-Bassett (Columbia University)

Comparing the Performance of State-of-the-Art Software Switches

Tianzhu Zhang, Leonardo Linguaglossa (Telecom ParisTech); Massimo Gallo (Nokia Bell Labs); Paolo Giaccone (Politecnico di Torino); Luigi Iannone (ParisTech); James Roberts (Telecom ParisTech)

Steering Hyper-Giants' Traffic at Scale

Enric Pujol, Ingmar Poese (BENOCs); Johannes Zerwas (Technische Universität München); Georgios Smaragdakis (TU Berlin); Anja Feldmann (MPI-Informatics)

Coffee Break (15:15 – 15:45)

Session: Security and Privacy (Room 101A-101B) (15:45 – 17:15)

Session chair: Patricia Callejo (IMDEA Networks)

Challenges in Inferring Spoofed Traffic at IXPs

Lucas Müller (UFRGS / CAIDA); Matthew Luckie (University of Waikato); Bradley Huffaker, kc claffy (CAIDA / UC San Diego); Marinho Barcellos (UFRGS / University of Waikato)

Beyond content analysis: Detecting targeted ads via distributed counting

Costas Iordanou (MPI); Nicolas Kourtellis (Telefonica Research); Juan Miguel Carrascosa (LSTech); Claudio Soriente (NEC Laboratories Europe); Ruben Cuevas (Universidad Carlos III de Madrid); Nikolaos Laoutaris (IMDEA Networks Institute)

An Investigation on Information Leakage of DNS over TLS

Rebekah Houser (University of Delaware); Zhou Li (UC Irvine); Haining Wang, Chase Cotton (University of Delaware)

DNS Privacy in Practice and Preparation

Casey Deccio (Brigham Young University); Jacob Davis (Sandia National Laboratories)

CoNEXT Community Meeting (Room 101A-101B) (17:15 – 17:45)

Welcome Reception & Poster Session (Room 109) (18:00 – 22:00)

N2Women Workshop (Room 101C) (18:00 – 22:00)

Wednesday, December 11

Session: Applications (Room 101A-101B) (09:00 – 10:00)

Session chair: Wei Gao (University of Pittsburgh)

Perceiving QUIC: Do Users Notice or Even Care?

Jan R  th, Konrad Wolsing, Klaus Wehrle (RWTH Aachen University); Oliver Hohlfeld (Brandenburg University of Technology)

Q-Tag: A transparent solution to measure ads viewability rate in online advertising campaigns

Patricia Callejo (IMDEA Networks Institute / Universidad Carlos III de Madrid); Antonio Pastor, Rub  n Cuevas,   ngel Cuevas (Universidad Carlos III de Madrid)

ABR Streaming with Separate Audio and Video Tracks: Measurements and Best Practices

Yanyuan Qin (University of Connecticut); Subhabrata Sen (AT&T Labs Research); Bing Wang (University of Connecticut)

Analyzing Viewport Prediction Under Different VR Interactions

Tan Xu, Bo Han (AT&T Labs - Research); Feng Qian (University of Minnesota - Twin Cities)

Coffee Break (10:00 – 10:30)

Wireless (Room 101A-101B) (10:30 – 12:00)

Session chair: Peter Steenkiste (Carnegie Mellon University)

Venii Vidi Dixi: Reliable Wireless Communication with Depth Images

Serkut Ayva  k, Murat G  rsu, Wolfgang Kellerer (Technical University of Munich)

EasyPass: Combating IoT Delay with Multiple Access Wireless Side Channels

Haoyang Lu, Ruirong Chen, Wei Gao (University of Pittsburgh)

Smartphone Positioning with Radio Measurements from a Single WiFi Access Point

Maurizio Rea (IMDEA Networks Institute); Traian Emanuel Abrudan (Nokia Bell Labs, Dublin, Ireland); Domenico Giustiniano (IMDEA Networks Institute); Holger Claussen (Nokia Bell Labs, Dublin, Ireland); Veli-Matti Kolmonen (Nokia Bell Labs, Espoo, Southern Finland, Finland)

ADS: Accurate Decoding of RFID tags at Scale

Tanmoy Das, Prasun Sinha (The Ohio State University)

Lunch (Rooms 109 and 101C) (12:00 – 13:30)

Session: Datacenters (Room 101A-101B) (13:30 – 15:15)

Session chair: Balajee Vamanan (University of Illinois at Chicago)

zD: A Scalable Zero-Drop Network Stack at End Hosts

Yimeng Zhao, Ahmed Saeed, Ellen Zegura, Mostafa Ammar (Georgia Institute of

Technology)

Enabling ECN for Datacenter Networks with RTT Variations

Junxue Zhang (Hong Kong University of Science and Technology); Wei Bai (Microsoft Research); Kai Chen (Hong Kong University of Science and Technology)

Reducing Tail Latency using Duplication: A Multi-Layered Approach

Hafiz Muhammad Mohsin Bashir, Abdullah Bin Faisal (Tufts University); M. Asim Jamshed (Intel Labs); Peter Vondras (Indigo Ag); Ali Musa Iftikhar (Tufts University); Ihsan Ayyub Qazi (LUMS); Fahad Dogar (Tufts University)

Sift: Resource-Efficient Consensus with RDMA

Mikhail Kazhamiaka, Babar Memon, Chathura Kankanamge, Siddhartha Sahu, Sajjad Rizvi, Bernard Wong, Khuzaima Daudjee (University of Waterloo)

Coffee Break (15:15 – 15:45)

Session: Measurements (Room 101A-101B) (15:45 – 17:00)

Session chair: Ruben Cuevas (Universidad Carlos III de Madrid)

UNARI: An Uncertainty-aware Approach to AS Relationships Inference

Guoyao Feng, Srinivasan Seshan, Peter Steenkiste (Carnegie Mellon University)

QPipe: Quantiles Sketch Fully in the Data Plane

Nikita Ivkin (Amazon); Zhuolong Yu, Vladimir Braverman, Xin Jin (Johns Hopkins University)

Tuple Space Explosion: A Denial-of-Service Attack Against a Software Packet Classifier

Levente Csikor, Dinil Mon Divakaran, Min Suk Kang (National University of Singapore); Attila Korosi, Balázs Sonkoly, David Haja (Budapest University of Technology and Economics); Dimitrios Pezaros (University of Glasgow); Stefan Schmid (University of Vienna); Gábor Rétvári (Budapest University of Technology and Economics)

Social Dinner (Disney's Boardwalk Resort) (17:30 – 22:30)

Thursday, December 12

Session: Design (Room 101A-101B) 09:00 – 10:15

Session chair: Wolfgang Kellerer (TU Munich)

AViC: A Cache for Adaptive Bitrate Video

Zahaib Akhtar, Yaguang Li, Ramesh Govindan (University of Southern California); Emir Halepovic, Shuai Hao (AT&T Labs Research); Yan Liu (University of Southern California); Subhabrata Sen (AT&T Labs Research)

RSS++: load and state-aware receive side scaling

Tom Barbette, Georgios P. Katsikas, Gerald Q. Maguire Jr., Dejan Kostic (KTH Royal Institute of Technology)

Egret: Simplifying Traffic Management for Physical and Virtual Network Functions

Yikai Lin (University of Michigan); Ajay Mahimkar, Bo Han, Zihui Ge, Vijay Gopalakrishnan (AT&T Labs Research); Z. Morley Mao (University of Michigan)

Coffee Break (10:15 – 10:45)

Session: Future Networks (Room 101A-101B) (10:45 – 12:00)

Session chair: Nikolaos Laoutaris (IMDEA Networks)

Network design at 27,000 km/hour

Debopam Bhattacharjee, Ankit Singla (ETH Zürich)

Loko: Predictable Latency in Small Networks

Amaury Van Bemten, Nemanja Deric, Johannes Zerwas, Andreas Blenk (Technical University of Munich); Stefan Schmid (University of Vienna); Wolfgang Kellerer (Technical University of Munich)

Flash: Efficient Dynamic Routing for Offchain Networks

Peng Wang, Hong Xu (City University of Hong Kong); Xin Jin (Johns Hopkins University); Tao Wang (New York University)

Boxed Lunch (Room 109) (12:00)

Student travel grants supported by

