Program chairs' message

Original

Availability:
This version is available at: 11583/2694965 since: 2017-12-17T11:52:59Z

Published
ACM

DOI:

Terms of use:
openAccess
This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)
CoNEXT ’17
Proceedings of the 2017
The 13th International Conference on emerging Networking EXperiments and Technologies

Sponsored by:
ACM SIGCOMM

Supported by:
KAIST, KIISE, NSF
Welcome Message from the General Chairs

It is our great pleasure to welcome you to CoNEXT 2017, one of ACM SIGCOMM’s four flagship conferences in networking, taking place in Incheon/Seoul in South Korea.

CoNEXT 2017 is a single-track event over three days, preceded by three one-day workshops and enhanced by several social events to foster interaction. Our Technical Program Co-Chairs, Marco Mellia and Phillipa Gill, together with an outstanding Technical Program Committee, have put together an exciting technical program of 32 full-length and 8 short papers. We defer to the TPC Chairs’ message for details. Mohammadreza Alizadeh is the recipient of this year’s ACM SIGCOMM Rising Star Award and will deliver the keynote speech in the main conference.

Three workshops taking place on the day before the main conference are: Cloud Assisted Networking (CAN), ICT Tools for Emergency Networks and Disaster Relief (I-TENDER), and the Student Workshop. CAN is co-chaired by Puneet Sharma and Jinho Hwang, and features a keynote by Kang-Won Lee. I-TENDER is the first workshop that focuses on networking for emergency and disaster situations. The CoNEXT Student Workshop is a unique event collocated with CoNEXT, addressed specifically to and free for students. This year, it is co-chaired by Nishanth Sastry, Pan Hui, and Sukyoung Lee, and features a keynote speech by Victor Li. The three workshops are chosen by the careful considerations of the workshop co-chairs: Peter Steenkiste, Rajesh Balan, and Jongwon Yoon.

We would like to appreciate many people that made this conference great. In addition to the aforementioned chairs, we would like to especially recognize the efforts of our dedicated Local Arrangements Chair, Sangheon Pack, who handled and coordinated the heavy load and wide range of local arrangements. Our diligent Publications Chair, Dongsu Han, has devoted himself to making sure the program is published on time. Shinae Woo has been our reliable webmaster, who has managed the web pages timely and thoroughly. Joon-sang Park, Sun Yi and David Choffnes served as the Travel Grants Chairs, including handling the NSF grant and evaluating the applications. Pedro Casas did a great job as the Publicity Chair. The ACM Conference Management Team has been a pleasure to work with. We are so lucky to have Simon Woo, who has been in charge of the financial details of the conference. We would like to thank the Steering Committee for being resourceful and responsive. CoNEXT has always encouraged and supported student participation, a tradition that successfully continues this year, thanks to the efforts of the travel grants and student workshop chairs, the volunteering and participation of local students, as well as to the generosity of our sponsors: KIISE and NSF. We are grateful to our sponsors that made this conference even greater.

We encourage you to consider taking a few days before or after the conference to enjoy the location and surrounding areas. Incheon is located right next to Seoul. There are great points of interest in both Incheon and Seoul. Incheon has a mix of tradition and modernism; Chinatown is 133 years old, and Songdo is filled with skyscrapers much like Central Park in Manhattan. Also, Wolmido is famous for its theme park, fun places, restaurants and so on. Seoul has been the
capital of Korea for longer than 600 years. More than 20 million people live in the Seoul metropolitan area, creating hubbub from all sorts of activities all around the year.

We hope that you enjoy the Technical Program and find CoNEXT 2017 to be a great stimulating event in both scientific and social aspects. Looking forward to seeing you at CoNEXT 2017 in December!

CoNEXT 2017 General Chairs

Sue Moon and Taekyoung (Ted) Kwon
TPC Chairs' Message

It is our pleasure to welcome you to the 13th edition of the ACM Conference on Emerging Networking Experiments and Technologies (ACM CoNEXT ‘17). Networking continues to be one of the key building blocks of vital societal services, with new technologies reshaping our life, from wireless connectivity and Internet of Things, to Content Delivery Networks and large-scale data centers. Experimental approaches are increasingly common with researchers adopting it to both assess the performance of proposed solutions, and to untangle complex systems and applications. In this panorama, ACM CoNEXT has become one of the preeminent conferences for the networking community at large.

For CoNEXT’17, we have composed a single-track program consisting of a keynote by Mohammadreza Alizadeh Attar from MIT (winner of this year’s ACM SIGCOMM "Rising Star" Award), followed by 31 long and 8 short paper presentations. These papers were chosen from the initial batch of 171 long papers (18.1% acceptance rate) and 51 short papers (15.7%). Overall, the acceptance rate was 18.0%.

There were a total of 222 papers submitted, 10% more than in the prior year, and the highest in the history of ACM CoNEXT. All papers proceeded to the review process which was split into two rounds. In the first round, each paper received three reviews. We largely followed Remzi Arpaci-Dusseau’s guidelines of promoting a paper to round two if it received at least one positive review. After an online discussion among reviewers, this led to 109 papers advancing to the second round where each paper received at least two additional reviews. With the round two complete, we held detailed online discussions to decide which papers to bring to the TPC meeting, and requested external reviews in several situations.

The Program Committee (PC) meeting was held in Rome, on September 1st. 39 PC members attended the meeting in person, while others joined online. We discussed 60 papers during the PC meeting. We almost always achieved consensus on the fate of the papers, and used excellence as our guiding principle. Short papers were judged according to the published guidelines in the call for papers. The discussions were detailed, and respectful.

Needless to say, we are very grateful to all authors who submitted their papers. We would also like to extend our warmest thanks to the PC members who did a terrific job in helping us to run the paper selection process in a very timely manner, and providing very thorough and objective reviews. We also thank Alessandro Mei for hosting the TPC meeting in Rome and showing the committee great Italian hospitality. Finally, we would like to thank the conference organizers, led by the General Co-chairs Sue Moon and Taekyoung "Ted" Kwon.

We sincerely hope that you will enjoy the ACM CoNEXT ’17 program.

Marco Mellia and Phillipa Gill

CoNEXT’17 Technical Program Committee Chairs
Contents

ACM CoNEXT 2017 Conference Organization .............................................. viii
ACM CoNEXT 2017 Sponsors & Supporters ................................................ xi

Keynote
Fast and Smart Network Resource Management for Datacenters and Beyond ........... 1
Mohammad Alizadeh (MIT)

Cellular Networks
Towards unlicensed cellular networks in TV white spaces ..................................... 2
Ghufran Baig (The University of Texas at Austin); Dan Alistarh (IST Austria); Thomas Karagiannis, Bozidar Radunovic, Matthew Balkwill (Microsoft Research); Lili Qiu (The University of Texas at Austin)

BLU: Blue-printing Interference for Robust LTE Access in Unlicensed Spectrum ........ 15
Ramanujan K Sheshadri (University at Buffalo, SUNY); Karthikeyan Sundaresan, Eugene Chai, Amir Khojastepour, Sampath Rangarajan (NEC Laboratories America, Inc.); Dimitrios Koutsonikolas (University at Buffalo, SUNY)

Dissecting DNS Stakeholders in Mobile Networks (Short paper) .......................... 28
Mario Almeida (UPC); Alessandro Finamore, Diego Perino (Telefonica Research); Narseo Vallina-Rodriguez (IMDEA Networks Institute and ICSI); Matteo Varvello (AT&T Labs - Research)

CDN and Caching
Identifying and Analyzing Broadband Internet Reverse DNS Names (Short paper) ........ 35
Youndo Lee, Neil Spring (University of Maryland)

Drongo: Speeding Up CDNs with Subnet Assimilation from the Client .................... 41
Marc Anthony Warrior, Uri Klarman, Marcel Flores, Aleksandar Kuzmanovic (Northwestern University)

Footprint Descriptors: Theory and Practice of Cache Provisioning in a Global CDN ........ 55
Aditya Sundarrajan (University of Massachusetts Amherst); Mingdong Feng, Mangesh Kasbekar (Akamai Technologies); Ramesh K. Sitaraman (University of Massachusetts Amherst and Akamai Technologies)

Redesigning CDN-Broker Interactions for Improved Content Delivery .................. 68
Matthew K. Mukerjee (Carnegie Mellon University); Ilker Nadi Bozkurt (Duke University); Devdeep Ray (Carnegie Mellon University); Bruce M. Maggs (Duke University / Akamai Technologies); Srinivasan Seshan (Carnegie Mellon University); Hui Zhang (Carnegie Mellon University / Conviva Inc.)
Security

A Churn for the Better: Localizing Censorship using Network-level Path Churn and Network Tomography (Short paper) ................................................................. 81
Shinyoung Cho (Stony Brook University/SUNY Korea); Rishab Nithyanand (Data & Society Research Institute); Abbas Razaghpanah (Stony Brook University); Phillipa Gill (University of Massachusetts, Amherst)

And Then There Were More: Secure Communication for More Than Two Parties ........................................ 88
David Naylor (Carnegie Mellon University, Microsoft Research); Richard Li (University of Utah, Microsoft Research); Christos Gkantsidis, Thomas Karagiannis (Microsoft Research); Peter Steenkiste (Carnegie Mellon University)

MaxLength Considered Harmful to the RPKI (Short paper) ................................................................. 101
Yossi Gilad (Boston University & MIT); Omar Sagga, Sharon Goldberg (Boston University)

On the Necessity of a Prescribed Block Validity Consensus: Analyzing Bitcoin Unlimited Mining Protocol ................................................................. 108
Ren Zhang, Bart Preneel (imec-COSIC, KU Leuven)

SIXPACK: Securing Internet eXchange Points Against Curious onlooKers ........................................ 120
Marco Chiesa (KTH Royal Institute of Technology, Université catholique de Louvain); Daniel Demmler (Technische Universität Darmstadt); Marco Canini (Université catholique de Louvain); Michael Schapira (Hebrew University of Jerusalem); Thomas Schneider (Technische Universität Darmstadt)

Jaal: Towards Network Intrusion Detection at ISP Scale ................................................................. 134
Azeem Aqil, Karim Khalil, Ahmed O.F. Atya, Evangelos E. Papalexakis, Srikanth V. Krishnamurthy (University of California, Riverside); Trent Jaeger (The Pennsylvania State University); K.K. Ramakrishnan (University of California, Riverside); Paul Yu, Ananthram Swami (U.S. Army Research Laboratory)

Transport Layer

ECF: An MPTCP Path Scheduler to Manage Heterogeneous Paths ........................................ 147
Yeon-sup Lim, Erich M. Nahum (IBM T.J. Watson Research Center); Don Towsley (University of Massachusetts Amherst); Richard J. Gibbens (University of Cambridge)

Multipath QUIC: Design and Evaluation (Short paper) ................................................................. 160
Quentin De Coninck, Olivier Bonaventure (Universite Catholique de Louvain)

TCP Congestion Control Beyond Bandwidth-Delay Product for Mobile Cellular Networks ........ 167
Wai Kay Leong, Zixiao Wang, Ben Leong (National University of Singapore)

Not All Apps Are Created Equal: Analysis of Spatiotemporal Heterogeneity in Nationwide Mobile Service Usage (Short paper) ................................................................. 180
Cristina Marquez, Marco Gramaglia (Universidad Carlos III de Madrid); Marco Fiore (CNR-IEIIT); Albert Banchs (Universidad Carlos III de Madrid and IMDEA Networks Institute); Cezary Ziemlicki, Zbigniew Smoreda (Orange Labs)

Light Communications

Follow that Light: Leveraging LEDs for Relative Two-Dimensional Localization ........................................ 187
Ander Galisteo (IMDEA Networks Institute & UC3M); Qing Wang, Aniruddha Deshpande, Marco Zuniga (Delft University of Technology); Domenico Giustinianno (IMDEA Networks Institute)
Revisiting Reading Rate with Mobility: Rate-Adaptive Reading in COTS RFID System 199
Qiongzheng Lin, Lei Yang (The Hong Kong Polytechnic University); Huanyu Jia, Chunhui Duan, Yunhao Liu (Tsinghua University)

SmartVLC: When Smart Lighting Meets VLC 212
Hongjia Wu (Delft University of Technology); Qing Wang (Delft University of Technology & KU Leuven); Jie Xiong (Singapore Management University); Marco Zuniga (Delft University of Technology)

Wireless and Localization
Zero Overhead Device Tracking in 60 GHz Wireless Networks using Multi-Lobe Beam Patterns 224
Adrian Loch (IMDEA Networks Institute); Hany Assasa, Joan Palacios (IMDEA Networks Institute and Universidad Carlos III de Madrid); Joerg Widmer (IMDEA Networks Institute); Hans Suys, Björn Debaillie (IMEC)

AWL: Turning Spatial Aliasing From Foe to Friend for Accurate WiFi Localization 238
Zhe Chen, Zhongmin Li, Xu Zhang, Guorong Zhu, Yuedong Xu (Fudan University); Jie Xiong (Singapore Management University); Xin Wang (Fudan University)

Localizing Low-power Backscatter Tags Using Commodity WiFi 251
Manikanta Kotaru, Pengyu Zhang, Sachin Katti (Stanford University)

Locating and Tracking BLE Beacons with Smartphones 263
Dongyao Chen, Kang G. Shin (University of Michigan, Ann Arbor); Yurong Jiang, Kyu-Han Kim (Hewlett Packard Labs)

Network Management and SDN
Catalyst: Unlocking the power of choice to speed up network updates (Short paper) 276
Rohan Gandhi (Carnegie Mellon University, Microsoft); Ori Rottenstreich (Princeton University); Xin Jin (Johns Hopkins University)

Hermes: Providing Tight Control over High-Performance SDN Switches 283
Huan Chen (University of Electronic Science and Technology of China and Duke University); Theophilus Benson (Brown University)

Supporting Diverse Dynamic Intent-based Policies using Janus 296
Anubhavnidhi Abhashkumar (University of Wisconsin Madison); Joon-Myung Kang (Hewlett Packard Labs); Sujata Banerjee (VMware); Aditya Akella (University of Wisconsin Madison); Ying Zhang (Facebook); Wenfei Wu (Tsinghua University)

Typhoon: An SDN Enhanced Real-Time Big Data Streaming Framework (Short paper) 310
Junguk Cho (University of Utah); Hyunseok Chang, Sarit Mukherjee, T.V. Lakshman (Nokia Bell Labs); Jacobus Van der Merwe (University of Utah)

CLOVE: Congestion-Aware Load Balancing at the Virtual Edge 323
Naga Katta (Salesforce.com, Princeton University); Aditi Ghag, Mukesh Hira (VMware); Aran Bergman, Isaac Keslassy (Technion, VMware); Changhoon Kim (Barefoot Networks); Jennifer Rexford (Princeton University)
Applications Layer

POI360: Panoramic Mobile Video Telephony over LTE Cellular Networks .......................... 336
Xiufeng Xie (University of Wisconsin-Madison); Xinyu Zhang (University of California San Diego)

Studying TLS Usage in Android Apps ................................................................. 350
Abbas Razaghpahan, Arian Akhavan Niai (Stony Brook University); Narseo Vallina-Rodriguez (IMDEA
Networks Institute and ICSI); Srikanth Sundaresan (Princeton University); Johanna Amann (ICSI);
Phillipa Gill (University of Massachusetts Amherst)

ZipNet-GAN: Inferring Fine-grained Mobile Traffic Patterns via a Generative Adversarial Neural
Network .................................................................................................................. 363
Chaoyun Zhang (The University of Edinburgh); Xi Ouyang (Huazhong University of Science and
Technology); Paul Patras (The University of Edinburgh)

Informed Bandwidth Adaptation in Wi-Fi Networks using Ping-Pair ............................... 376
Rajdeep Das (Microsoft Research India); Nimantha Baranasuriya (National University of Singapore);
Venkata N. Padmanabhan (Microsoft Research India); Christoffer Rodbro (Microsoft Skype);
Seth Gilbert (National University of Singapore)

Physical Layer

FreeRider: Backscatter Communication Using Commodity Radios ................................. 389
Pengyu Zhang, Colleen Josephson (Stanford); Dinesh Bharadia (UCSD); Sachin Katti (Stanford)

Channel Spoofe r: Defeating Channel Variability and Unpredictability ............................ 402
Yue Qiao, Kannan Srinivasan, Anish Arora (The Ohio State University)

Compressive Millimeter-Wave Sector Selection in Off-the-Shelf IEEE 802.11ad Devices ........ 414
Daniel Steinmetzer, Daniel Wegemer, Matthias Schulz (TU Darmstadt); Joerg Widmer (IMDEA
Networks Institute); Matthias Hollick (TU Darmstadt)

Cloud and Datacenters

Canopus: A Scalable and Massively Parallel Consensus Protocol .................................... 426
Sajjad Rizvi, Bernard Wong, Srinivasan Keshav (University of Waterloo)

Saath: Speeding up CoFlows by Exploiting the Spatial Dimension ............................... 439
Akshay Jajoo (Purdue University); Rohan Gandhi (Carnegie Mellon University, Microsoft); Y. Charlie Hu,
Cheng-Kok Koh (Purdue University)

Tagger: Practical PFC Deadlock Prevention in Data Center Networks ............................ 451
Shuihai Hu (Hong Kong University of Science and Technology); Yilbo Zhu (Microsoft Research);
Peng Cheng (Microsoft Research Asia); Chuangxiang Guo (Microsoft Research); Kun Tan (Huawei);
Jitendra Padhye (Microsoft Research); Kai Chen (Hong Kong University of Science and Technology)

Towards Reliable Application Deployment in the Cloud ............................................ 464
Ruichuan Chen, Istemi Ekin Akkus (Nokia Bell Labs); Bimal Viswanath (University of Chicago);
Ivica Rimac, Volker Hilt (Nokia Bell Labs)

Author index ................................................................................................................. 478
ACM CoNEXT 2017 Conference Organization

**General Chairs:** Taekyoung "Ted" Kwon (*Seoul National University, Korea*)
Sue Moon (*KAIST, Korea*)

**Program Chairs:** Phillipa Gill (*University of Massachusetts, USA*)
Marco Mellia (*Politecnico di Torino, Italy*)

**Workshop Chairs:** Rajesh Balan (*Singapore Management University, Singapore*)
Peter Steenkiste (*Carnegie Mellon University, USA*)
Jongwon Yoon (*Hanyang University, Korea*)

**Student Workshop Chairs:** Pan Hui (*Hong Kong University of Science and Technology, China*)
Sukyoung Lee (*Yonsei University, Korea*)
Nishanth Sastry (*King's College London, UK*)

**Travel Grants Chairs:** Joon-sang Park (*Hongik University, Korea*)
Sun Yi (*Chinese Academy of Sciences, China*)
David Choffnes (*Northeastern University, USA*)

**Finance Chair:** Simon Woo (*SUNY Korea, Korea*)

**Local Arrangement Chair:** Sangheon Pack (*Korea University, Korea*)

**Publicity Chair:** Pedro Casas (*Austrian Institute of Technology, Austria*)

**Publications Chair:** Dongsu Han (*KAIST, Korea*)

**Webmaster:** Shinae Woo (*University of California, Berkeley, USA*)
Steering Committee:  
Dina Papagiannaki (Google, USA)  
Max Ott (NICTA, Australia)  
Hamed Haddadi (QMUL, UK)  
Vishal Misra (Columbia University, USA)  
Luigi Rizzo (Google, USA)  
Peter Steenkiste (Carnegie Mellon University, USA)  
Patrick Thiran (EPFL, Switzerland)  

Program Committee:  
Adrian Perrig (ETH Zurich, Switzerland)  
Alan Mislove (Northeastern University, USA)  
Alberto Dainotti (CAIDA, USA)  
Alessandro Mei (Sapienza University, Italy)  
Ana Paula Couto Da Silva (Universidade Federal de Minas Gerais, Brasil)  
Anna Brunström (Karlstad University, Sweden)  
Aruna Balasubramanian (Stony Brook University, USA)  
Athina Markopoulou (University of California, Irvine, USA)  
Christian Esteve Rothenberg (University of Campinas, Brasil)  
Costin Raiciu (University Politehnica of Bucharest, Romania)  
Cristina Nita Rotaru (Northeastern University, USA)  
Dali Kaafar (NICTA, Australia)  
Damiano Carra (University of Verona, Italy)  
Dario Rossi (ENST, France)  
David Barrera (ETH Zurich, Switzerland)  
David Choffnes (Northeastern University, USA)  
Dejan Kostic (KTH Royal Institute of Technology, Sweden)  
Domenico Giustiniano (IMDEA Networks Institute, Spain)  
Dongsu Han (KAIST, Korea)  
Felipe Huici (NEC Labs, Germany)  
Ganesh Ananthanarayanan (Microsoft Research, USA)
Giuseppe Bianchi (University of Rome Tor Vergata, Italy)
Idilio Drago (Politecnico di Torino, Italy)
Kyle Jamieson (Princeton, USA)
KyoungSoo Park (KAIST, Korea)
Laurent Vanbever (ETH Zurich, Switzerland)
Luca Muscariello (Cisco Systems, USA)
Marcelo Bagnulo Braun (University Carlos III of Madrid, Spain)
Matteo Varvello (AT&T, USA)
Matthew Roughan (University of Adelaide, Australia)
Michael Schapira (Hebrew University of Jerusalem, Israel)
Monia Ghobadi (Microsoft Research, USA)
Narseo Vallina-Rodriguez (IMDEA Networks Institute, Spain / ICSI, USA)
Özgü Alay (Simula, Norway)
Paolo Costa (Microsoft Research, UK)
Patrick Thiran (EPFL, Switzerland)
Ramin Sadre (UC Louvain, Belgium)
Ranjita Bhagwan (Microsoft Research, India)
Robert Birke (IBM Zurich, Switzerland)
Samir Das (Stony Brook University, USA)
Sergey Gorinsky (IMDEA Networks Institute, Spain)
Sujata Banerjee (VMWare Research, USA)
Suman Banerjee (University of Wisconsin–Madison, USA)
Sung-Ju Lee (KAIST, Korea)
Vijay Sivaraman (University of New South Wales)
Wenjun Hu (Yale University, USA)
Zhi-li Zhang (University of Minnesota–Twin Cities, USA)
Zied Ben Houidi (Nokia Bell Labs, USA)
ACM CoNEXT 2017 Sponsors & Supporters

Sponsors:

![ACM Logo](image1)
![ACM SIGCOMM Logo](image2)

Supporters:

![KAIST Logo](image3)
![Korean Institute of Information Scientists and Engineers Logo](image4)
![NSF Logo](image5)