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## NEWS RELEASE

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### **SIGCOMM 2018 TO SHOWCASE EXCITING INNOVATIONS IN THE APPLICATIONS, TECHNOLOGIES, ARCHITECTURES, AND PROTOCOLS FOR COMPUTER NETWORKS**

#### **Application of AI to Computer Networks, Miniature Devices that Can Communicate from Within the Human Body, and More to be Presented**

**New York, NY, August 8, 2018** – The Association for Computing Machinery (ACM) Special Interest Group on Data Communication (SIGCOMM) today announced highlights of SIGCOMM 2018, its annual flagship conference, which will be held this year in Budapest, Hungary from August 20-25th. The six-day conference is considered the leading venue on the applications, technologies, architectures and protocols for wired and wireless networks.

Communication networks and their underlying infrastructure have fueled the digital revolution of the last 25 years and will serve as a lynchpin in our interconnected world in the years ahead. SIGCOMM encompasses all aspects of networks and networked systems, including packet processing, hardware and software, virtualization, mobility, sensors, energy consumption, novel applications of artificial intelligence (AI) to networking, and usability of underlying networking technologies.

Jennifer Rexford of Princeton University will receive the SIGCOMM 2018 Award for Lifetime Contribution and deliver the conference keynote address. In addition to the main conference, SIGCOMM 2018 will include 44 posters and 22 demos, 12 workshops, 13 industrial demos, a student research competition, community feedback sessions, topic preview, mentoring sessions and award ceremonies.

“Many members of our SIGCOMM 2018 Organizing Committee have worked hard to ensure that the attendees will leave Budapest with invigorating memories of innovations presented in the technical program as well as natural beauty and cultural sophistication of the Hungarian capital” said General Co-Chair Sergey Gorinsky of IMDEA Networks Institute. “The main conference is held in the legendary Vigadó Concert Hall, the workshops and tutorials in the nearby InterContinental Hotel, and the hackathon in Nokia Skypark. The distinctive social events include the Reception coinciding with spectacular fireworks on the Danube, Student Dinner in the Bálna (Whale) Building, and Banquet as a cruise on Európa Ship.”

“In planning SIGCOMM ’18, we wanted authors to be daring and emphasize novelty and creativity,” said SIGCOMM 2018 Program Co-Chair Dina Katabi. “We believe that the criteria for being accepted by SIGCOMM should not merely be that the paper is very well executed. We should also be seeking out new ideas that bring a different perspective and allow the conference to evolve and stay in the forefront of innovation,” added Program Co-Chair Mark Handley.

This year program shows an emphasis on bringing new technologies to computer networks. For example, some papers optimize the design of networked systems using machine learning, while others

enable low-power miniature devices that communicate from inside the human body. The conference also offers two-separate full-day workshops which explore the intersection of machine learning and computer networks.

## **2018 ACM SIGCOMM HIGHLIGHTS**

### **RESEARCH PAPERS (Partial List)**

#### **“Inferring Persistent Interdomain Congestion”**

Amogh Dhamdhere (*CAIDA, USA*), David D. Clark (*MIT, USA*), Alexander Gamero-Garrido (*CAIDA, USA*), Matthew Luckie (*Waikato, New Zealand*), Ricky K. P. Mok, Gautam Akiwate, Kabir Gogia (*CAIDA, USA*), Vaibhav Bajpai (*TU Munich, Germany*), Alex C. Snoeren (*UCSD, USA*), kc claffy (*CAIDA, USA*)

Understanding congestion is central for the proper functioning of the Internet. The authors design a process for identifying whether a particular peering link is congested or not. They provide interesting observations regarding the types of links that tend to get congested, the duration of congestion episodes, their persistence across time. The authors intend to make their tool and data public in order to inform regulatory processes around network inter-connection.

#### **“Enabling Deep-Tissue Networking for Miniature Medical Devices”**

Yunfei Ma, Zhihong Luo, Christoph Steiger, Fadel Adib (*MIT*), Giovanni Traverso (*MIT and Harvard*)

The authors present IVN (In-Vivo Networking), a system that enables powering up and communicating with miniature sensors implanted or injected in deep tissues. IVN overcomes fundamental challenges which have prevented past systems from powering up miniature sensors beyond superficial depths.

#### **“Oboe: Auto-tuning Video ABR Algorithms to Network Conditions”**

Zahaib Akhtar, Ramesh Govindan (*USC*), Yun Seong Nam, Sanjay Rao, Bruno Martins Ribeiro (*Purdue*), Jessica Chen (*UWindsor*), Ethan Katz Bassett (*Columbia*), Jibin Zhan, Hui Zhang (*Conviva*)

Most content providers are interested in providing good video delivery quality of experience (QoE) for all users, not just on average. In this paper, the authors propose a technique called Oboe to auto-tune these parameters to different network conditions.

#### **“Fast Millimeter Wave Beam Alignment”**

Haitham Hassanieh (*UIUC*), Omid Abari (*UWaterloo*), Mohammed Abdelghany (*UCSB*), Michael Rodriguez, Dina Katabi, Piotr Indyk (*MIT*)

There is much interest in integrating millimeter wave radios (mmWave) into wireless LANs and 5G cellular networks to benefit from their multi-GHz of available spectrum. In this paper, the authors present Agile-Link, a new protocol that can find the best mmWave beam alignment without scanning the space.

### **Workshops and Tutorials(Partial List)**

#### **Workshop on Network Meets AI & ML (NetAI 2018).**

Distributed processing systems for Artificial Intelligence (AI) and Machine Learning (ML), such as Hadoop, Spark, Storm, GraphLab, TensorFlow etc., are widely used by industry. On the one hand, networking is a well-known bottleneck for AI & ML systems. On the other hand, the ever increasing complexity of networks makes effective monitoring, modeling, auditing, and overall control of network traffic difficult if not impossible. Hence there is a need for more powerful methods to solve the challenges faced in network design, deployment, and management. With two keynote addresses and

ten tutorials, [NetAI 2018](#) provides a venue for presenting innovative ideas to discuss future research agendas in computer networking of/by/for AI & ML systems.

### **All-Day Workshop on Big Data Analytics and Machine Learning for Data Communication Networks (Big-DAMA 2018)**

Big data and machine learning are transforming the world, and the data communication networks domain is not an exception. Despite recent major advances of big data analysis frameworks, their application to the network measurements analysis domain remains poorly understood and investigated, and most of the proposed solutions are in-house and difficult to benchmark. The [Big DAMA](#) all-day workshop presents novel contributions in the field of machine learning and big data analytics applied to data communication network analysis, including scalable analytic techniques and frameworks capable of collecting and analyzing both on-line streams and off-line massive datasets, network traffic traces, topological data, and performance measurements. Big DAMA includes two key addresses and eight separate tutorials.

### **Tutorial on Programming the Network Data Plane (P4)**

This [popular tutorial](#) will provide participants with a hands-on introduction to the [P4 language](#). Attendees will learn how to express conventional and novel data-plane applications in the P4 language, and how to compile, execute, and evaluate P4 programs using Mininet, a network emulation framework.

### **Tutorial on the Role of NFV and Kernel Bypass in High Performance Networking (HPNFV)**

[This tutorial](#) will offer an introduction to Network Function Virtualization (NFV) technologies and in-depth hands-on understanding of an NFV platform to demonstrate their use in building high performance middleboxes and endpoint services.

### **Hackathon**

For the first time in SIGCOMM history, the conference will include an all-day Hackathon aimed at encouraging students, researchers and engineers to gain experience through collaboration in contributing to open source software. Participants will be encouraged to transfer their research experience and expertise in open source development, and foster reproducibility of research results.

### **Best-of-CCR Session**

The editors of *Computer Communication Review (CCR)*, an online journal of SIGCOMM, selected the two best papers from among the submissions they received this year.

### **“Inside the Walled Garden: Deconstructing Facebook’s Free Basics Program”**

*Rijurekha Sen, Sohaib Ahmad, Amreesh Phokeer, Zaid Ahmed Farooq, Ihsan Ayyub Qazi, David Choffnes, Krishna P. Gummadi*

Network measurements play a key role in the network neutrality debate. In this paper, the authors set up measurement experiments, both at the client and server side, to inform the discussion around the Facebook Free Basics program. Free Basics is an initiative to provide zero-rated web services in developing countries that fired up concerns about creating unfair advantage over normal paid services as well as potential negative effects on first-time Internet users because of poor performance. Notably, to “deconstruct Free Basics from within its walled garden”, the authors developed and deployed their own web services on the Free Basics platform, including an educational site publishing free English-language and Mathematics educational material.

## **“Towards a Rigorous Methodology for Measuring Adoption of RPKI Route Validation and Filtering”**

*Andreas Reuter, Randy Bush, Italo Cunha, Ethan Katz-Bassett, Thomas C. Schmidt, Matthias Whlisch*

The Border Gateway Protocol (BGP) is one of the key protocols in today’s Internet. Routers use BGP to distribute interdomain routes to ensure that all networks attached to the Internet remain reachable. BGP was designed when security concerns and attacks were not as severe as they are today. Researchers and network operators have proposed several techniques to improve the security of BGP. Given the size of the Internet, it is impossible to entirely replace BGP with a new and more secure protocol. The only possibility to secure interdomain routing is to evolve BGP. This paper explores approaches to creating a more secure Border Gateway Protocol (BGP).

Additional information about SIGCOMM 2018, including a full program and schedule of events, may be found <http://conferences.sigcomm.org/sigcomm/2018/>.

### **About SIGCOMM**

SIGCOMM (<http://www.sigcomm.org/>) is ACM's professional forum for the discussion of topics in the field of communications and computer networks, including technical design and engineering, regulation and operations, and the social implications of computer networking. The SIG's members are particularly interested in the systems engineering and architectural questions of communication.

### **About ACM**

ACM, the Association for Computing Machinery ([www.acm.org](http://www.acm.org)), is the world’s largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field’s challenges. ACM strengthens the computing profession’s collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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