NEWS RELEASE

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50th ANNIVERSARY OF ACM SIGCOMM CONFERENCE PREVIEWS FUTURE OF OUR CONNECTED WORLD

Leading-edge Research on Communications Networks, Internet of Things to be Showcased in Beijing

New York, NY, August 13, 2019 – The Association for Computing Machinery's (ACM) Special Interest Group on Data Communication (SIGCOMM) today announced highlights of SIGCOMM 2019, its annual flagship conference. The six-day conference, considered the leading venue on the applications, technologies, architectures and protocols for wired and wireless networks, will be held in Beijing, China, from August 19-24. SIGCOMM 2019 features 32 highly innovative papers, along with 43 posters, 19 demos and 10 industrial demos. Special activities are planned to mark SIGCOMM's 50th anniversary and this will be the first time that the conference will be held in mainland China.

There are several major trends reshaping the field of computer networks. For one, the number of devices connected to the internet as part of the Internet of Things (IoT) continues to grow exponentially. IoT Analytics estimates that there are currently 7 billion devices connected to the internet, and the number is expected to climb to 21 billion by 2025. At the same time, more and more people are "always connected" via WiFi devices. Other important trends include greater volumes of content being streamed from the internet due the growth of cloud computing; new AI-based applications that will impact communication networks; and the expected emergence of 5G technologies in the very near future.

The SIGCOMM conference attracts researchers and practitioners from around the world, who present work on all aspects of data communication networks and network systems. Topics explored include everything from improving the internet's architecture, to increasing capacity needed to handle Internet of Things-connected devices, and the use of AI and machine learning in communications networks.

"The SIGCOMM conference takes a broad view of networking research and examines the pressing challenges that arise from the increasing interconnectedness of our society," said ACM SIGCOMM 2019 General Co-chair Jianping Wu of Tsinghua University, China. "The amount of data being transferred over existing networks is growing exponentially, and new approaches will be needed to ensure a steady flow continues."

"As the ACM's Special Interest Group on Data Communication marks its 50th anniversary, few could have predicted the impact of the internet, as well as the other technologies that allow people and organizations to share information so efficiently," said SIGCOMM 2019 General Co-chair Wendy Hall of the University of Southampton, UK. "Since its inception, SIGCOMM has been an open platform to provide opportunities to scholars, researchers and students to acquaint themselves with the most exciting research in computer networks. This year's program continues this outstanding tradition."

2019 ACM SIGCOMM HIGHLIGHTS
Visit the SIGCOMM 2019 Program Page for a full list of research papers, workshops, and events**.**

50th Anniversary Panel: "Past and Future Directions in Networking Research"
The panel will start with a brief introductory video by Vint Cerf before opening up to discussions with the panelists. The panel will be moderated by Bruce Maggs (Duke University and Akamai Technologies) and include Dah Ming Chiu (Chinese University of Hong Kong); Manya Ghobadi (Massachusetts Institute of Technology); Mark Handley (University College, London); Jennifer Rexford (Princeton University); and Lixia Zhang (University of California, Los Angeles).

Keynote Address/SIGCOMM Lifetime Achievement Award
Mark Handley (University College London)
The annual SIGCOMM Award will be presented to Mark Handley "for fundamental contributions to Internet multimedia, multicast, congestion control, and multi-path networks, and the standardization of Internet protocols in these domains." The award recognizes major contributions to the field of communication networks.

Research Papers (Partial List)
"Enabling a Permanent Revolution in Internet Architecture"
James McCauley, Yotam Harchol (*UC Berkeley); Aurojit Panda* (*NYU); Barath Raghavan* (*USC); Scott Shenker* (*UC Berkeley and ICSI)*
While the current internet architecture is acknowledged as inherently flawed, it is also deeply entrenched, posing a challenge to significant improvements. In this paper, researchers propose a backwards-compatible architectural framework in which one can incrementally deploy radically new designs, leading to a permanent revolution in internet architecture by easing the deployment of new architectures and allowing multiple coexisting architectures to be used simultaneously by applications.

"Vantage: Optimizing Video Upload for Time-shifted Viewing of Social Livestreams"
Devdeep Ray, Jack Kosaian, K.V. Rashmi, Srinivsan Seshan (*Carnegie Mellon University)*
Social live video streaming (SLVS) applications are becoming increasingly popular with the rise of platforms such as Facebook-Live, YouTube-Live, Twitch and Periscope, but not all what the content live. Existing technology silos viewers into either receiving low latency video at a lower quality or a higher quality video with a significant delay penalty, without accounting for the presence of diverse time-shifted viewers. In this paper, researchers present Vantage, a live-streaming upload solution that improves the overall quality of experience for diverse time-shifted viewers by using selective quality-enhancing retransmissions in addition to real-time frames, optimizing the encoding schedules to balance the allocation of the available bandwidth between the two.

"TEAVAR: Striking the Right Utilization-Availability Balance in WAN Traffic Engineering"
Jeremy Bogle, Nikhil Bhatia, Manya Ghobadi (*MIT); Ishai Menache, Nikolaj Bjorner* (*Microsoft Research); Asaf Valadarsky, Michael Schapira* (*Hebrew University)*

The researchers draw inspiration from financial risk theory to enable cloud network operators to strike a utilization-availability balance that allows them to efficiently utilizing WAN capacity while withstanding unexpected traffic shifts that result in link/node failures. Their TEAVAR (Traffic Engineering Applying Value at Risk), tested extensively across many network topologies, failure scenarios, and traffic patterns, shows that operators can support up to twice as much throughput as state-of-the-art TE schemes, at the same level of availability.

"A Millimeter Wave Network for Billions of Things"
Mohammad Hossein Mazaheri, Soroush Ameli, Ali Abedi, Omid Abari (*University of Waterloo)*
The Internet of Things (IoT)—with billions of new connected devices coming online—places a huge strain on today's WiFi and cellular spectrum. While millimeter wave (mmWave) technology can revolutionize wireless networks and solve spectrum shortage through the usage of massive chunks of high-frequency spectrum, adapting this technology presents challenges, including the need for substantial energy and computing power. The researchers propose designing a mmWave network for low-power, low-cost IoT devices that uses mmX, a novel mmWave network that addresses existing challenges in exploiting mmWave for IoT devices, and discuss their implemented and evaluation of mmX.

"Leveraging Quantum Annealing for Large MIMO Processing in Centralized Radio Access Networks"
Eric Liang, Lon Stoica (*UC Berkeley); Hang Zhu, Xin Jin* (*Johns Hopkins University)*
The researchers, by leveraging quantum annealing, address the challenge of meeting user demand for increasing amounts of wireless capacity via QuAMax is the first large MIMO cloud-based radio access network design. Currently, higher-performance systems remain impractical largely only because their algorithms are extremely computationally demanding. For optimal performance, an amount of computation that increases at an exponential rate both with the number of users and with the data rate of each user is often required.

Workshops
The 2nd NEAT workshop aims to provide a forum for both industry and academia to exchange ideas about network architectures, technologies, and protocols specifically in the context of emerging applications, with a particular focus on internetworking technologies that achieve accurate prescribed latency, high throughput, and meet service level objectives in complex and high-scale networks.

The NetAI 2019 workshop provides a forum for networking researchers to present and share their latest research on building self-driving networks and coupling the technological advances in networking with scientific innovations in AI and ML.

The Network and Programming Languages workshop provides a forum to bring together researchers and practitioners from the fields of programming languages, formal methods, software verification and networking. NetPL 2019 will bridge between the areas of PL, formal verification and networking, thus enabling language specialists to apply the wealth of theoretical and practical knowledge on designing and implementing languages and compilers that has been developed over the years.

The Optical Systems Design workshop focuses on the design and implementation of optical networked systems for the next-generation Cloud infrastructure. These systems pose a number of research challenges spanning multiple research areas, e.g., physical layer, scheduling, synchronization, congestion control, orchestration, and topology reconfiguration, which require cross-layer and cross-disciplinary solutions. The workshop aims to bring together participants across the optics, networking, systems, and

distributed algorithms community to jointly tackle these challenges and foster discussions and collaboration opportunities across these communities.

The Mobile Air-Ground Edge Computing, Systems, Networks, and Applications (MAGESys 2019) workshop will address advances in distributed artificial intelligence, edge computing, and distributed control in autonomous air-ground vehicles (AGV). MAGESys proposes itself as a forum to discuss transversal cross-domain research efforts on cooperative autonomous air-ground vehicles and their applications.

Hackathon
Participants will identify and help resolve challenges related to "Measuring and Debugging Real Network Systems," or other project of their interest, related to research topics of the SIGCOMM 2019 conference.

About SIGCOMM
SIGCOMM 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, 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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