NEWS RELEASE

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WITH COVID-19 PANDEMIC AS BACKDROP, ACM SIGCOMM UNDERSCORES IMPORTANCE OF COMMUNICATIONS TECHNOLOGIES THAT KEEP DAILY LIFE FUNCTIONING

World's Leading Computer Communications Conference to Be Held Virtually for the First Time in Its History

New York, NY, August 10, 2020 – The Association for Computing Machinery's Special Interest Group on Data Communication (ACM SIGCOMM) today announced highlights of SIGCOMM 2020, its annual flagship conference. The five-day conference, considered the leading venue on the applications, technologies, architectures and protocols for wired and wireless networks, will be held virtually for the first time in its 50-year history from August 10-14.

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 advances in programmable switches and the ability to program them to supporting video applications—a very timely topic.

SIGCOMM 2020 features its largest-ever program of 53 innovative papers, along with 43 posters, 19 demos and 10 industrial demos. In addition, the main conference program includes a "Best of CCR" session and exciting industrial speakers.

"2020 will likely be remembered for the COVID-19 pandemic and its tremendous global impact," said Program Co-chair Sujata Banerjee, VMware Research. "The contributions of the academic and industrial networking community have enabled us to stay connected in these difficult times. Because the research collaborations and new ideas that come out of SIGCOMM are so essential to today's world, we were determined to stay on track with the event. Far from being curtailed by the COVID-19 pandemic, thanks to the efforts of our research community, this year's program will be our most extensive to date."

"Our community of networking and computer communications researchers is perhaps best-positioned to develop a leading-edge virtual conference," added ACM SIGCOMM 2019 General Co-chair Henning Schulzrinne of Columbia University. "We've designed the conference to foster a good deal of personal interactions that will hopefully lead to new collaborations. Another bright spot of this year's conference

is that, because it is virtual, many more people will be able to participate. We are looking forward to seeing how an-all virtual worldwide event will showcase and incubate research in an entirely new way."

2020 ACM SIGCOMM HIGHLIGHTS
Visit the SIGCOMM 2020 Program Page for a full list of research papers, workshops, and events**.**

Keynote Address/SIGCOMM Lifetime Achievement Award

This year, SIGCOMM is recognizing two Lifetime Achievement awardees who will both be presenting keynote speeches at the conference. The award recognizes major contributions to the field of communication networks.

Amin Vahdat (Google Inc.)
The annual SIGCOMM Award will be presented to Amin Vahdat for groundbreaking contributions to datacenter and wide-area networks. The title of Vahdat's keynote address is "Coming of Age in the Fifth Epoch of Distributed Computing: The Power of Sustained Exponential Growth."

Lixia Zhang (University of California, Los Angeles)
The annual SIGCOMM Award will be presented to Lixia Zhang for her many insights into data network architectures and the interactions between network components. The title of Zhang's keynote address is "Learning the Art and Science in Internet Protocol Designs."

Research Papers (Partial List)

"Switch Code Generation using Program Synthesis"
Xiangyu Gao, Taegyun Kim, Michael D. Wong, Aatish Kishan Varma, Anirudh Sivaraman (New York University); Divya Raghunathan, Aarti Gupta (Princeton University); Pravein Govindan Kannan (National University of Singapore); Srinivas Narayana (Rutgers University)
Writing packet-processing programs for programmable switch pipelines is challenging because of their all-or-nothing nature: a program either runs at line rate if it can fit within pipeline resources, or does not run at all. This paper presents a compiler, Chipmunk, which formulates code generation as a program synthesis problem. Chipmunk uses a program synthesis engine, SKETCH, to transform high-level programs down to switch machine code.

"A Computational Approach to Packet Classification"
Alon Rashelbach, Ori Rottenstreich, Mark Silberstein (Technion)
Multi-field packet classification is a crucial component in modern software-defined data center networks. In this paper, the authors describe an efficient training algorithm that guarantees the correctness of the RQ-RMI-based classification.

"Concurrent Entanglement Routing for Quantum Networks: Model and Designs"
Shouqian Shi, Chen Qian (University of California, Santa Cruz)

Quantum entanglement enables important computing applications such as quantum key distribution. The authors present a comprehensive entanglement routing model that reflects the differences between quantum networks and classical networks as well as a new entanglement routing algorithm that utilizes the unique properties of quantum networks.

"bf4: towards bug-free P4 programs"
Dragos Dumitrescu, Radu Stoenescu, Lorina Negreanu, Costin Raiciu (University Politehnica of Bucharest)
Recent verification work has made advances in finding bugs in P4 programs before deployment, but it requires that the programmer specifies table rules that are possible at runtime. The authors present bf4, a novel verification approach for P4 programs that uses a mix of static verification, code changes and runtime checks to ensure that the deployed P4 program is bug free.

"Neural-Enhanced Live Streaming: Improving Live Video Ingest via Online Learning"
Jaehong Kim, Youngmok Jung, Hyunho Yeo, Juncheol Ye, Dongsu Han (Korea Advanced Institute of Science and Technology (KAIST))
Live video accounts for a significant volume of today's Internet video. Despite a large number of efforts to enhance user quality of experience (QoE) both at the ingest and distribution side of live video, the fundamental limitations are that streamer's upstream bandwidth and computational capacity limit the quality of experience of thousands of viewers. To overcome this limitation, the authors have designed LiveNAS, a new live video ingest framework that enhances the origin stream's quality by leveraging computation at ingest servers.

"Turboboosting Visible Light Backscatter Communication"
Yue Wu, Purui Wang, Kenuo Xu, Lilei Feng, Chenren Xu (Peking University)
Visible light backscatter communication (VLBC) presents an emerging low power IoT connectivity solution with spatial reuse and interference immunity advantages over RF-based (backscatter) technologies. State-of-the-art VLBC systems employ COTS LCD shutter as optical modulator, whose slow response fundamentally throttles its data rate to sub-Kbps, and limits its deployment at scale for use cases where higher rate and/or low latency is a necessity. To address this problem, the authors have designed and implemented RetroTurbo, a VLBC system dedicated for turboboosting data rate.

"Sirius: A Flat Datacenter Network with Nanosecond Optical Switching"
Hitesh Ballani, Paolo Costa, Raphael Behrendt, Daniel Cletheroe, Istvan Haller, Krzysztof Jozwik, Fotini Karinou, Sophie Lange, Kai Shi, Benn Thomsen, Hugh Williams (Microsoft Research)
The increasing gap between the growth of datacenter traffic and electrical switch capacity is expected to worsen due to the slowdown of Moore's law, motivating the need for a new switching technology for the post-Moore's law era that can meet the increasingly stringent requirements of hardware-driven cloud workloads. The authors propose Sirius, an optically-switched network for datacenters providing the abstraction of a single, high-radix switch that can connect thousands of nodes—racks or servers—in a datacenter while achieving nanosecond-granularity reconfiguration.

"Akamai DNS: Providing Authoritative Answers to the World's Queries"

Kyle Schomp, Onkar Bhardwaj, Eymen Kurdoglu, Mashooq Muhaimen (Akamai Technologies); Ramesh K. Sitaraman (University of Massachusetts at Amherst/Akamai Technologies)
The authors present Akamai DNS, one of the largest authoritative DNS infrastructures in the world, that supports the Akamai content delivery network (CDN) as well as authoritative DNS hosting and DNS-based load balancing services for many enterprises. The authors also convey insights from operating the production system that are of value to the broader research community.

Workshops

Teaching and Learning Computer Networking During the Pandemic and Beyond
The Covid-19 pandemic resulted in a massive, unanticipated, rapid, and near universal switch from face-to-face to completely online teaching and learning at colleges and universities around the world. There's been a tremendous amount of innovation, improvisation, and learning-by-doing around the world. This workshop will be an opportunity to identify challenges, discuss solutions, and share knowledge and experience.

Secure Programmable Network Infrastructure (SPIN 2020)
The 1st SPIN workshop aims to provide a forum for the community to come together and rethink fundamental questions in Internet security. The Internet was not designed with a secure foundation. However, as more and more applications rely on secure network services, the importance of network security has grown significantly.

Traffic Manipulation (ManTra 2020)
The ManTra workshop provides a forum for researchers, practitioners, network operators, and the Internet standards community to present and discuss the state of the art in traffic manipulation attacks and countermeasures. The workshop considers different types of attackers, from very strong ones such as the corrupt operators and MitM adversaries to weak off-path attackers and different type of attacks, all that utilize manipulation of traffic for achieving the attack goal, as well as the defenses against them.

NetAI 2020 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.

Network Application Integration/CoDesign (NAI 2020)
Today, more than 4 billion users (half of the global population) and 20 billion devices are online — the exponential growth of the connected people and devices are expected to continue over the next years. However, the general-purpose and best-effort model of the Internet is challenged due to the ever-growing demand for more complex applications with stricter application-specific requirements. How can we deliver 4k videos to everybody (including the rest 4 billion people)? How can we ensure ultra-low latency for applications such as self-driving cars and cloud gaming? This workshop examines the contributions to the design principles and real implementations of systems that enable network-application co-design.

Hot Topics in Video Analytics and Intelligent Edges (HotEdgeVideo 2020)

Cameras are everywhere! Analyzing live videos from these cameras has great potential to impact science and society. This workshop calls for research on various issues and solutions that can enable live video analytics with the role for edge computing. Topics include low-cost video analytics, network design for video streams, and video analytics for social good, among many others.

Optical Systems Design (OptSys 2020)

Optical equipment is a fundamental component of modern systems. Today, nearly all wide-area, metro, and data center communications are carried over optical technology making optics a billion-dollar industry. Optics is poised to play an even bigger role in next-generation networks. The OptSys workshop focuses on the design and implementation of optical networked systems for the next-generation Cloud infrastructure.

Evolution, Performance, and Interoperability of QUIC (EPIQ 2020)

The transport protocol QUIC has emerged from a proprietary effort undertaken by Google to a next generation transport protocol being standardized in the Internet Engineering Task Force (IETF). This workshop will explore novel ideas and future directions of QUIC and its interaction with applications and networks.

Networking Women Professional Development Workshop (N2Women'20)

The N2Women workshop aims to foster connections among the under-represented women in computer networking and related research fields. The N2Women workshop has three main goals: Connect newer generations of networking women researchers with the community and create mentorship relationships; Create a research forum in which students and junior researchers learn and discuss current trends in networking, present their research and receive feedback; Engage a diverse body of junior researchers in the field.

About SIGCOMM

ACM SIGCOMM is the annual flagship conference of ACM's Special Interest Group on Data Communications. It serves as 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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