Adnan Ahmed

Research Interests

Internet Measurement; Web Performance; Computer Networks; Quality-of-Service/Quality-of-Experience

Education

- 2015-present **Ph.D. in Computer Science**, The University of Iowa Advisors: Rishab Nithyanand; Zubair Shafiq
 - 2009–2013 B.S. in Computer Science, Lahore University of Management Sciences, Pakistan

Employment

- 2019 Amazon, Inc. AWS Networking Intern
- 2018 Center for Applied Internet Data Analysis (CAIDA) Research Intern
- 2016 Verizon Digital Media Services Research & Development Intern
- 2015— University of Iowa
- Present Research Assistant, Department of Computer Science

Publications

PAM FlowTrace: A Framework for Active Bandwidth Measurements Using In-band Packet Trains 2020 Adnan Ahmed, Ricky Mok, Zubair Shafiq

International Conference on Passive and Active Network Measurement, Oregon, 2020

- ICNP **Suffering from Buffering? Detecting QoE Impairments in Live Video Streams** 2019 **Adnan Ahmed**, Zubair Shafiq, Harkeerat Bedi, Amir Khakpour
- IEEE International Conference on Network Protocols, Toronto, 2019
- ICNP Peering vs. Transit: Performance Comparison of Peering and Transit Interconnections
- 2019 Adnan Ahmed, Zubair Shafiq, Harkeerat Bedi, Amir Khakpour IEEE International Conference on Network Protocols, Toronto, 2019
- SIGMETRICS **QoE Analysis of a Large-Scale Live Video Streaming Event** 2016 **Adnan Ahmed**, Zubair Shafiq, Amir Khakpour *ACM SIGMETRICS, Antibes Juan-les-Pins, 2016*
 - INFOCOM Sneak-Peek: High Speed Covert Channels in Data Center Network
 - 2016 Rashid Tahir, M. Taha Khan, Xun Gong, **Adnan Ahmed**, AmirEmad Ghassami, Hasanat Kazmi, Matthew Caesar, Fareed Zaffar, Negar Kiyavash *IEEE International Conference on Computer Communications, San Francisco, 2016*
 - ICC On the Co-existence of Transport Protocols in Data Centers
 - 2014 Syed M. Irteza, **Adnan Ahmed**, Sana Farrukh, Babar Memon, Ihsan A. Qazi IEEE International Conference on Communications, Sydney, 2014

Skills & Expertise

Programming Languages: Python, C, C++, JavaScript, Go, SQL, MATLAB, Java **Tools & Frameworks:** Selenium, MahiMahi, WprGo, OpenWPM, Android, WireShark, MPEG-DASH **Techniques:** Web crawling, Data processing, Machine learning, Statistical analysis, Network measurements

Projects

In Progress	WebPerf—How are HTML Attributes Implemented Across the Web?
	• Measured the prevalence of resource loading-related HTML attributes like preload, async etc.
	• Evaluated the performance impact of these attributes on the page load performance
	 Used machine learning to understand how web developers implement these attributes
In Progress	ATOMIX—A Data-Driven Approach to HTTP/2 Server Push
	• Collected server-side HTTP request logs at a large-scale commercial Content Delivery Network
	• Designed a data-driven technique using Markov chains to discover pushable resources on the web pages hosted by the CDN
	• Instrumented MahiMahi–a webpage record-replay tool–to implement and evaluate the performance impact of HTTP/2 server push on popular web pages
PAM 2020	Flow Trace—A Framework to Conduct Network Measurements using Application Traffic
	• Designed a framework to leverage application traffic to implement active network measurement techniques and decrease the associated network overheads
	• Implemented pathneck—a tool to identify bottlenecks along end-to-end network paths-in FlowTrace
	• Evaluated the performance of FlowTrace as well as latency overheads for the application traffic
ICNP 2019	Peering vs. Transit—A Performance Comparison
	 Designed a JavaScript-based end-to-end latency measurement framework
	• Conducted latency measurements between clients across the Internet and the servers of a large commercial CDN at multiple IXPs
	 Analyzed the performance aspects of peering and transit interconnections
ICNP 2019	Suffering from Buffering—Detecting QoE Impairments in Live Video Streams
	• Characterized the QoE of live video and conducted a measurement study of a popular live video streaming event hosted by a large-scale commercial CDN
	 Analyzed the impact of QoE impairments on user engagement
	• Designed a PCA-based data-driven technique to detect QoE impairments in real-time

Honors and Awards

- 2020 Graduate College Post-Comprehensive Research Fellowship, University of Iowa
- 2019 Student Travel Awards, USENIX NSDI
- 2017 Student Travel Awards, ACM SIGCOMM
- 2016 Student Travel Awards, AIMS, ACM IMC, ACM CoNEXT

Teaching & Services

- Peer Review ACM IMC '17 (Shadow Program Committee Member); IEEE INFOCOM 2016 (External Reviewer); ACM SIGCOMM 2014 (External Reviewer)
 - Teaching Intro to Computer Networks, Intro to Computer Science,

References

Prof. Rishab Nithyanand Assistant Professor, Department of Computer Science, University of Iowa. rishab-nithyanand@uiowa.edu

Prof. Zubair Shafiq Associate Professor, Department of Computer Science, University of California, Davis. zshafiq@ucdavis.edu

Prof. Octav Chipara Associate Professor, Department of Computer Science, University of Iowa. octav-chipara@uiowa.edu