Arpit Gupta

▬▬▬ Research Interests

As a systems researcher, I design and build flexible, scalable, and deployable systems that solve the real-world problems at the intersection of networking, security, and machine learning. Currently, my focus is on making distributed network-telemetry system scalable and robust to traffic dynamics, and building self-driving network-management systems for last-mile networks.

▬▬▬ Education

August 2018	**Princeton University**, *Ph.D.*, Computer Science. *Dissertation*: Flexible and Scalable Systems for Network Management *Adviser*: Nick Feamster *Honorary Mention, SIGCOMM Dissertation Award*
Spring 2016	**Princeton University**, *M.A.*, Computer Science.
Spring 2013	**NC State University**, *M.S.*, Computer Science.
Spring 2009	**Indian Institute of Technology, Roorkee**, *B.Tech.*, Electronics & Comm.

▬▬▬ Professional Experience

Summer 2019–	**University of California, Santa Barbara**, *Assistant Professor*, Santa Barbara, CA.
2018–2019	**Columbia University**, *Postdoctoral Research Scientist*, New York, NY.
2015–2018	**Princeton University**, *Research Assistant*, Princeton, NJ.
Summer 2016	**Microsoft Research**, *Research Intern*, Redmond, WA.
2013–2014	**Georgia Tech**, *Research Assistant*, Princeton, NJ.
2011–2012	**NC State University**, *Research Assistant*, Raleigh, NC.
Summer 2011	**Google**, *Software Engineering Intern*, Mountain View, CA.
Spring 2010	**Indian Institute of Science**, *Project Assistant*, Bangalore, India.

▬▬▬ Awards

2018	Honorable Mention, SIGCOMM Dissertation Award
2017	Best Paper Award winner, ACM SOSR
2017	Facebook Fellowship finalist
2016	USENIX "Best of the Rest" Paper Award for Best Paper in all USENIX Conferences
2016	USENIX Community Contribution Award, USENIX/ACM Symposium on Networked Systems Design and Implementation
2015	Facebook Fellowship finalist
2013	Internet-2 Innovation Award winner
2013	Meissner Fellowship, Purdue University (declined)
2010	College of Engineering Fellowship, North Carolina State University

▬▬▬▬ Publications

Conferences

[1] Arpit Gupta Zili Meng Lianjin Ye Jingyu Xiao Jie Chen Zekun He Xulong Luo Jilong Wang Heng Yu Congcong Miao, Minggang Chen. Detecting Ephemeral Optical Events with OpTel. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2022.

[2] Vivek Adarsh, Michael Nekrasov, Udit Paul, Alexander Ermakov, Arpit Gupta, Morgan Vigil-Hayes, Ellen W Zegura, and Elizabeth M Belding. Coverage is Not Binary: Quantifying Mobile Broadband Quality in Urban, Rural and Tribal Contexts. In *International Conference on Computer Communications and Networks (ICCCN)*, 2021.

[3] Vivek Adarsh, Michael Nekrasov, Udit Paul, Alexander Ermakov, Arpit Gupta, Morgan Vigil-Hayes, Ellen W Zegura, and Elizabeth M Belding. Too Late for Playback: Estimation of Video Stream Quality in Rural and Urban Contexts. In *Passive and Active Measurement Conference (PAM)*, 2021.

[4] Todd Arnold, Ege Gürmeriçliler, Georgia Essig, Arpit Gupta, Matt Calder, Vasileios Giotsas, and Ethan Katz-Bassett. (How Much) Does a Private WAN Improve Cloud Performance? In *IEEE Conference on Computer Communications (INFOCOM)*, 2020.

[5] **Arpit Gupta**, Rob Harrison, Ankita Pawar, Marco Canini, Nick Feamster, Jennifer Rexford, and Walter Willinger. Sonata: Query-Driven Network Telemetry. In *ACM SIGCOMM*, 2018.

[6] Robert MacDavid, Rüdiger Birkner, Ori Rottenstreich, **Arpit Gupta**, Nick Feamster, and Jennifer Rexford. Concise Encoding of Flow Attributes in SDN Switches. In *ACM Symposium on SDN Research (SOSR)*, 2017.
Best Paper Award (1 out of 77).

[7] **Arpit Gupta**, Robert MacDavid, Rüdiger Birkner, Marco Canini, Nick Feamster, Jennifer Rexford, and Laurent Vanbever. An Industrial-Scale Software Defined Internet Exchange Point. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2016.
Community Award (1 out of 255).

[8] Hyojoon Kim, Joshua Reich, **Arpit Gupta**, Muhammad Shahbaz, Nick Feamster, and Russ Clark. Kinetic: Verifiable Dynamic Network Control. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2015.
150+ citations till Apr 2021 based on Google Scholar.

[9] **Arpit Gupta**, Laurent Vanbever, Muhammad Shahbaz, Sean Patrick Donovan, Brandon Schlinker, Nick Feamster, Jennifer Rexford, Scott Shenker, Russ Clark, and Ethan Katz-Bassett. SDX: A Software Defined Internet Exchange. In *ACM SIGCOMM*, 2014.
400+ citations till Apr 2021 based on Google Scholar.

[10] **Arpit Gupta**, Jeongki Min, and Injong Rhee. Wifox: Scaling wifi performance for large audience environments. In *ACM Conference on Emerging Networking Experiments and Technologies (CoNEXT)*, 2012.
77 citations till Apr 2021 based on Google Scholar.

Workshops & Short Papers

[11] Hyojoon Kim and **Arpit Gupta**. ontas: Flexible and scalable online network traffic anonymization system.

[12] Todd Arnold, Matt Calder, **Arpit Gupta**, Italo Cunha, Michael Schapira, and Ethan Katz-Bassett. Beating BGP is Harder than We Thought. In *ACM HotNets*, 2019.

[13] **Arpit Gupta**, Chris MacStoker, and Walter Willinger. An Effort to Democratize Networking Research in the Era of AI/ML. In *ACM HotNets*, 2019.

[14] Rob Harrison, Qizhe Cai, **Arpit Gupta**, and Jennifer Rexford. Network-Wide Heavy Hitter Detection with Commodity Switches. In *ACM Symposium on SDN Research (SOSR)*, 2018.

[15] Rüdiger Birkner, **Arpit Gupta**, Nick Feamster, and Laurent Vanbever. SDX-Based Flexibility or Internet Correctness?: Pick Two! In *ACM Symposium on SDN Research (SOSR)*, 2017.

[16] **Arpit Gupta**, Rüdiger Birkner, Marco Canini, Nick Feamster, Chris Mac-Stoker, and Walter Willinger. Network Monitoring as a Streaming Analytics Problem. In *ACM Workshop on Hot Topics in Networks (HotNets)*, 2016.

[17] **Arpit Gupta**, Nick Feamster, and Laurent Vanbever. Authorizing Network Control at Software Defined Internet Exchange Points. In *ACM Symposium on SDN Research (SOSR)*, 2016.

[18] **Arpit Gupta**, Matt Calder, Nick Feamster, Marshini Chetty, Enrico Calandro, and Ethan Katz-Bassett. Peering at the Internet's Frontier: A First Look at ISP Interconnectivity in Africa. In *Passive and Active Network Measurement (PAM)*, 2014.
77 citations till Apr 2019 based on Google Scholar.

Research Proposals and Grants

Scaling Network Security with PISA Switches.
Sponsor: Verizon
Investigator(s): A. Gupta
Amount: $ 200,000 for 2 years.
Awarded: December 2019.

Self-Driving Broadband Networks.
Sponsor: Beegol Inc.
Investigator(s): A. Gupta
Amount: $ 35,000 for 1 year.
Awarded: July 2020.

Workshop on Next-G Mobile Security.
Sponsor: NSF
Investigator(s): A. Gupta
Amount: $ 49,000 for 1 year.
Awarded: July 2020.

MLWiNS: RL-based Self-driving Wireless Network Management System for QoE Optimization.
Sponsor: NSF
Investigator(s): A. Gupta (PI), E. Belding, Y. Wang
Amount: $ 560,000 for 3 years.
Awarded: July 2020.

MLWiNS: RL-based Self-driving Wireless Network Management System for QoE Optimization.
Sponsor: Intel
Investigator(s): A. Gupta (PI), E. Belding, Y. Wang
Amount: $ 280,000 for 3 years.
Awarded: July 2020.

Presentations

Making the "Net" Work: Flexible and Scalable Systems for Network Management

Universities: Texas A&M University (02/18), UC Santa Barbara (02/18), Northeastern University (03/18), University of Virginia (03/18), University of Minnesota (04/18), University of Toronto (04/18)

Sonata: Query-Driven Streaming Network Telemetry

Conferences: ACM HotNets (11/16), NANOG 70 (05/17), P4 Workshop (05/17)

Industry: Comcast (12/16), NIKSUN Inc. (06/17), AT&T (10/17)

Universities: New England Networking & Systems Day, Boston University (10/16)

iSDX: An Industrial-Scale Software Defined IXP

Conferences: USENIX NSDI (03/16), USENIX ATC (06/16), GENI Network Innovators Community Event (12/16)

Industry: AT&T (10/15), Project Endeavour (10/15), Corsa (11/15), CloudRouter (01/16), Open Networking Foundation Webinar (04/16), Appfest (05/16)

Universities: Networked Systems Laboratory, USC (08/15))

Authorizing Network Control at Software Defined IXPs

Conferences: ACM SOSR (03/16)

Industry: Verisign Inc. (08/15)

SDX: A Software Defined Internet Exchange

Conferences: ACM SIGCOMM (08/14), GENI Engineering Conference 20 (06/14), NANOG 59 (10/13), OpenIX Summit (04/15))

Industry: Facebook Inc. (08/14), Microsoft (08/14)

Universities: NetSeminar, Stanford University (10/14)

Peering at the Internet's Frontier

Conferences: Workshop on Passive and Active Measurements (03/14)

WiFox: Scaling WiFi Performance for Large Audience

Conferences: ACM SIGCOMM CoNEXT (12/12)

Universities: Duke University (10/12), UNC Chapel Hill (10/12)

Professional Activities

Program Committee Chair

2021	ACM SIGCOMM Artifact Evaluation Committee, Virtual
2020	ACM SIGCOMM Student Research Competition, Virtual
2019	ACM SIGCOMM Workshop on Network Meets AI & ML (NetAI), Beijing, CN

Organizing Committee Chair

2020	NSF Workshop on NextG Security, Virtual
2019	NSF Workshop on Measurements for Self-driving Networks, Princeton

Program Committee Member

2021	ACM SIGCOMM
2021	USENIX Networked System Design and Implementation (NSDI)
2020	ACM SIGCOMM
2020	USENIX Networked System Design and Implementation (NSDI)
2019	ACM Conference on Emerging Networking Experiments and Technologies (CoNEXT)

2019	ACM SIGCOMM Symposium on SDN Research (SOSR)
2018	ACM SIGCOMM Workshop on Self-Driving Networks

<u>Organizing Committee Member</u>

2018	NSF Workshop on Self-driving Networks, Princeton

<u>Panelist</u>

2016	GENI Network Innovators Community Event 2016
2016	CITP Conference on Global Internet Interconnection

<u>External Reviewer</u>

2019	Privacy Enhancing Technologies Symposium (PETS)
2017	ACM SIGCOMM
2016	IEEE International Conference on Network Protocol (ICNP)
2014	USENIX Networked System Design and Implementation (NSDI)

<u>Journal Reviewer</u>

IEEE/ACM Transactions on: Networking (TNET), Mobile Computing (TMC), Network Science and Engineering (TNSE), Computer Networks Journal (COMNET), Photonic Network Communications (PNET) Journal of Network and Computer Applications (JNAC), Cloud Computing, Special Issue: Middleware and Middlecloud (CCMSI), International Journal of Network Management (IJNM)

Teaching

<u>Instructor</u>

Winter 2020	ML For Networked Systems, (CS 293N), UCSB
Spring 2020	Advanced Topics in Internet Computing,, (CS 176C), UCSB
Winter 2021	Programmable Networks, (CS 176B), UCSB
Spring 2021	Advanced Topics in Internet Computing, (CS 176C), UCSB

<u>Teaching Assistant</u>

Spring 2016	Computer Networks (COS 461), Princeton University
Summer 2013	Computer Organization & Assembly Language, (CSC 236), NC State University
Fall 2012	Internet Protocols (CSC 573), NC State University

<u>Course Development</u>

Spring 2016	Securing Cyberspace with Big Data (COS 598E), Princeton University
Summer 2015	Software Defined Networking, Coursera
Fall 2014	Software Defined Networking (CS 4270), Gerogia Tech
Summer 2014	Software Defined Networking, Coursera

<u>Guest Lecture</u>

Fall 2017	Advanced Computer Networks (COS 561), Princeton University
Spring 2017	Computer Networks (COS 461), Princeton University

<u>Ph.D. Students</u>

<u>Current</u>

Fall 2019 – *	Sanjay Chandrasekaran, UCSB, Ph.D.
Fall 2020 – *	Rohan Bhatia, UCSB, Ph.D.