

Rachee Singh

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www.github.com/racheesingh

EDUCATION	University of Massachusetts, Amherst 2016 – Doctor of Philosophy, Computer Science. <i>Advisor:</i> Prof. Phillipa Gill <i>Awarded Google PhD Fellowship in Systems and Networking (2018)</i>
	University of Massachusetts, Amherst 2016 – 2018 (Expected) Master of Science, Computer Science.
	Stony Brook University 2015 – 2016 Doctor of Philosophy, Computer Science. <i>(Transferred)</i> <i>Advisor:</i> Prof. Phillipa Gill
	Birla Institute of Technology and Science - Pilani, India 2008 – 2012 Bachelor of Engineering (Honors), Computer Science. <i>Co-op host organization:</i> Arista Networks, Bangalore, India.
RESEARCH EXPERIENCE	Microsoft Research , Redmond, Intern May 2018 – August 2018 <i>Advisor:</i> Sharad Agarwal and Victor Bahl Title: Peering-aware WAN traffic engineering. Analyzing IPFix flow records in the Microsoft WAN using internal tools like Kusto and Cosmos.
	Microsoft Research , Redmond, Intern June 2017 – August 2017 <i>Advisor:</i> Monia Ghobadi Improving the throughput and availability of WAN optical links.
	International Computer Science Institute , Berkeley, Intern May 2016 – August 2016 <i>Advisor:</i> Sadia Afroz and Prof. Vern Paxson. Characterizing the abusive traffic that originates from anonymous communication networks like Tor and analyzing IP threat intelligence to find factors that impact rate at which Tor IPs harness a bad reputation.
AWARDS AND FELLOWSHIPS	<i>Google PhD Fellowship (Systems and Networking)</i> March 2018 <i>ACM Student Research Competition SIGCOMM – Silver medal</i> August 2016
INDUSTRY EXPERIENCE	Arista Networks , Bangalore. Software Engineer. July 2012 – July 2015 Building features for Open Shortest Path First protocol for IPv6 including Link State Update throttle timers for preventing network churn, support for totally stubby NSSA areas, Virtual Routing and Forwarding (VRF) support for OSPFv3.
	CERN , Switzerland. Google Summer of Code Intern. June – Sep 2012 Built a geographically aware Domain Name System for CERN VMFS clients. The geo-DNS system allows low latency access to the servers by responding with the address of the server geographically closest to the querying client.
	Arista Networks , Bangalore. Software Engineer Intern. July – Dec 2011 Converted the Python implementation of Address Resolution Protocol to C++ to reduce the memory footprint of the protocol. Also developed test infrastructure utilities. (Was offered a full time position in the company after the completion of the internship).
PUBLICATIONS AND PRE-PRINTS	Peering-aware Traffic Engineering in Software Defined WANs Rachee Singh , Sharad Agarwal, Victor Bahl, Phillipa Gill, Jitu Padhye, and Parveen Patel.

(In submission at **HotNets** 2019)

PredictRoute: A Network Path Prediction Toolkit

Rachee Singh, David Tench, Albert Williams, Phillipa Gill, and Andrew McGregor.

(In submission)

Characterizing the deployment and performance of multi-CDNs

Rachee Singh, Arun Dunna, and Phillipa Gill.

In: ACM IMC 2018, Boston, MA.

RADWAN: Rate Adaptive Wide Area Network

Rachee Singh, Monia Ghobadi, Klaus-Tycho Foerster, Phillipa Gill, and Mark Filer. In: ACM SIGCOMM 2018, Budapest, Hungary.

Run, Walk, Crawl: Towards Dynamic Link Capacities

Rachee Singh, Monia Ghobadi, Klaus-Tycho Foerster, Phillipa Gill, and Mark Filer. In: ACM HotNets 2017, Palo Alto, CA.

Characterizing the Nature and Dynamics of Tor Exit Blocking

Rachee Singh, Rishab Nithyanand, Sadia Afroz, Paul Pearce, Michael Carl Tschantz, Phillipa Gill, and Vern Paxson. In: 26th USENIX Security Symposium (**USENIX Security** 17). Vancouver, BC.

PathCache: A Path Prediction Toolkit

Rachee Singh and Phillipa Gill. In: Proceedings of the 2016 ACM SIGCOMM Conference. **SIGCOMM** 16. Florianopolis, Brazil. (Poster)

[*Awarded the silver medal in the SIGCOMM ACM Student Research Contest*].

The Politics of Routing: Investigating the Relationship Between AS Connectivity and Internet Freedom

Rachee Singh, Hyungjoon Koo, Najmehalsadat Miramirkhani, Fahimeh Mirhaj, Phillipa Gill, and Le-man Akoglu. In: 6th USENIX Workshop on Free and Open Communications on the Internet (**FOCI** 2016). Austin, TX.

Holding all the ASes: Identifying and Circumventing the Pitfalls of AS-aware Tor Client Design

Rishab Nithyanand, **Rachee Singh**, Shinyoung Cho, and Phillipa Gill

(In submission at **Transactions of Privacy and Security**) Arxiv Preprint 2016.

TALKS AND PRESENTATIONS	Applied Networking Research Workshop 2018 , Montreal, Canada	July 2018
	USENIX Security , Vancouver, BC	August 2017
	New England Security Day , Northeastern University	September 2017
	Title: Characterizing the Nature and Dynamics of Tor Exit Blocking.	
	USENIX Security, FOCI Workshop , Austin, TX	August 2016
	Title: Politics of Routing.	
	New England Security Day , Harvard University	April 2016
Title: Cipollino: A Measurement Driven AS-aware Tor Client		
AIMS, 2016 , University of California, San Diego	Feb 2016	
Title: Applications for Measurement Data: Improving Anonymity Online. [Slides]		
PyCon India, 2012	Sep 2012	
Presented a tutorial on building a Linux cluster using Python and a distributed message queue.		

TEACHING EXPERIENCE	Introduction to Databases	Aug 2015 – Dec 2015
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Grading student homework assignments, exams and projects. Holding office hours. Coursework included SQL based database queries and database design in Microsoft Access Design View.

Programming Languages and Compilers

Jan – July 2012

Involved with the organization of the course project (detection of regular polygons). Building a command line tool to evaluate the student submissions.

MIT Indian Mobile Initiative

July – Aug 2011

Student mentor for the MIT-backed initiative to teach Android development. Organized lab sessions and mentored students to gain proficiency in developing complex Android applications.

LANGUAGES Python, C, Java.

COURSEWORK **Advanced Artificial Intelligence - UMass Amherst**
Research Methods in Empirical CS - UMass Amherst
Advanced Algorithms - UMass Amherst
Probability and Random Processes - UMass Amherst
Advanced Operating Systems - Stony Brook University
Advanced Computer Networks - Stony Brook University
Advanced Database Systems - Stony Brook University
Internet Censorship - Stony Brook University
Parallel Computing - BITS Pilani

TESTS **Graduate Record Exam (GRE)**
1420/1600 [Quantitative: 800/800, Verbal: 620/800]

July 2011

TOEFL
117/120

Oct 2014