

Ramakrishnan Sundara Raman

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📅 Updated: 21 March 2023



Research Interests

My research interests lie in Internet security and privacy, with a focus on using Internet measurement methods to detect, analyze and prevent large-scale threats to Internet users' security and privacy.

Education

- 2018 – Present 📌 **PhD Candidate, University of Michigan** in Computer Science and Engineering
Advisor: Prof. Roya Ensafi
Thesis title: Global, Longitudinal, and Data-Driven Investigation of Network Censorship
CGPA: 3.95 out of 4
My research involves longitudinally measuring Internet censorship and network interference at global scale, and examining the technologies that enable censorship and surveillance. I lead work on the [Censored Planet Observatory](#), which is a platform for measuring various types of network interference continuously around the world. I am the recipient of an OTF Information Controls Fellowship, Rackham Predoctoral Fellowship, and an IRTF Applied Networking Research Prize.
- 2013 – 2017 📌 **Bachelor of Technology, Vellore Institute of Technology** in Computer Science and Engineering
Project Title: Measuring Last-Mile Internet Reliability During Severe Weather
CGPA: 9.69 out of 10
Rank in CSE: 2 out of 648

Work Experience

- July 2022 – September 2022 📌 **Research Intern, Cloudflare Inc.**
I interned with the Cloudflare research team in Summer 2022, where I worked on detecting large-scale traffic tampering from an operator's point of view.
🔗 <https://research.cloudflare.com/outreach/academic-programs/interns/ram-sundararaman/>
- November 2021 – July 2022 📌 **OTF Senior ICFP Fellow in Information Controls, The Citizen Lab**
My project with the Citizen Lab focused on locating and examining network censorship devices and their deployments in different countries.
🔗 <https://www.opentech.fund/about/people/ramakrishnan-sundara-raman/>
- August 2020 – December 2020 📌 **Graduate Student Instructor, University of Michigan**
I worked as the lead graduate student instructor for EECS 588 - the graduate level computer and network security course in the department. My responsibilities included helping with designing the course and assessments, leading classes in the absence of the instructor, holding office hours, helping students with their course projects, and grading.
🔗 <https://www.eecs.umich.edu/courses/eecs588/>
- August 2018 – Present 📌 **Graduate Student Research Assistant, University of Michigan**
I work as a research assistant advised by Prof. Roya Ensafi, and my research focuses on problems in Internet Security and Privacy.
🔗 <https://ramakrishnansr.com>
- July 2017 – May 2018 📌 **Associate Consultant, Microsoft Global Delivery**
I worked in the Business Applications domain to build Enterprise Systems that can deliver value to large organizations around the world.

March 2017 – July 2017

■ **Research Intern, University of Maryland**

Advisor: Prof. Neil Spring

As an undergraduate research scholar, I worked in the Systems and Networking lab at the University of Maryland on a project that involved measuring last-mile residential Internet outages in areas affected by severe weather conditions. I worked with the ThunderPing tool, which uses several distributed vantage points to ping residential IP addresses. My goals at UMD were twofold: to develop a real-time system for detecting and visualizing Internet outages and to categorize detected outages by their potential cause, such as network and power outages. I designed and built a web-based visualization that uses ThunderPing's probes to detect and display residential outages in real time. My group and I also worked on detecting instances of correlated outages, such as those caused by network and power failure, in the data we had collected.

Poster presented at ACM Internet Measurement Conference 2017: "Measuring Last-Mile Internet Reliability During Severe Weather"

May 2016 – July 2016

■ **Intern, Microsoft Global Delivery**

During my summer internship, I worked as a data analytics consultant. The internship involved a team effort to integrate data analytics into Microsoft's project management tool. The tool was built on ASP.NET and Microsoft's Power BI tool was utilized to make interactive reports that provided valuable insight to the users.

June 2015

■ **Intern, OSI Consulting Pvt. Ltd.**

My summer internship involved training in PL/SQL and Oracle Software with qualified internal employees. Multiple projects and assignments were completed during the period of internship.

Research Publications

○ **Network Responses to Russia's Invasion of Ukraine in 2022: A Cautionary Tale for Internet Freedom**

R. Ramesh*, R. Sundara Raman*, A. Virkud, A. Dirksen, A. Huremagic, D. Fifield, D. Rodenburg, R. Hynes, D. Madory, R. Ensafi

USENIX Security Symposium, August 2023

🔗 <https://ramakrishnansr.com/assets/russia-ukraine-invasion.pdf>

* Both authors contributed equally to this research

○ **Detecting DNS Manipulation using TLS Certificates**

E. Tsai, D. Kumar, R. Sundara Raman, G. Li, Y. Eiger, R. Ensafi

Privacy Enhancing Technologies Symposium (PETS), July 2023

○ **Advancing the Art of Censorship Data Analysis**

R. Sundara Raman, A. Virkud, S. Laplante, V. Fortuna, R. Ensafi

Free and Open Communications on the Internet (FOCI), February 2023

🔗 <https://ramakrishnansr.com/assets/censorship-data-analysis.pdf>

○ **Network Measurement Methods for Locating and Examining Censorship Devices**

R. Sundara Raman*, M. Wang*, J. Dalek, J. Mayer, and R. Ensafi

ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT), December 2022

🏆 IRTF Applied Networking Research Prize

🔗 https://ramakrishnansr.com/assets/censorship_devices.pdf

* Both authors contributed equally to this research

○ **A Large-scale Investigation into Geodifferences in Mobile Apps**

R. Kumar, A. Virkud, R. Sundara Raman, A. Prakash, and R. Ensafi

USENIX Security Symposium, August 2022

🔗 <https://ramakrishnansr.com/assets/appmap.pdf>

○ **A Multi-Perspective View of Internet Censorship in Myanmar**

R. Padmanabhan, A. Filastò, M. Xynou, **R. Sundara Raman**, K. Middleton, M. Zhang, D. Madory, M. Roberts, and A. Dainotti

Free and Open Communications on the Internet (FOCI), August 2021

🔗 <https://ramakrishnansr.com/assets/myanmar.pdf>

- **Lost in Transmission: Investigating Filtering of COVID-19 Websites**

A. Vyas, **R. Sundara Raman**, N. Ceccio, P. Lutscher, and R. Ensafi

Financial Cryptography and Data Security (FC), March 2021

🔗 <https://ramakrishnansr.com/assets/covid.pdf>

- **Censored Planet: An Internet-wide, Longitudinal Censorship Observatory**

R. Sundara Raman, P. Shenoy, K. Kohls, and R. Ensafi

ACM Conference on Computer and Communications Security (CCS), November 2020

🔗 <https://ramakrishnansr.com/assets/censoredplanet.pdf>

- **Investigating Large Scale HTTPS Interception in Kazakhstan**

R. Sundara Raman, L. Evdokimov, E. Wustrow, A. Halderman, and R. Ensafi

ACM Internet Measurement Conference (IMC), October 2020

🏆 Best Paper Award Nominee

🔗 <https://ramakrishnansr.com/assets/Kazakhstan.pdf>

- **Measuring the Deployment of Network Censorship Filters at Global Scale**

R. Sundara Raman, A. Stoll, J. Dalek, R. Ramesh, W. Scott, R. Ensafi

Network and Distributed System Security Symposium (NDSS), February 2020

🔗 <https://ramakrishnansr.com/assets/filtermap.pdf>

- **Decentralized Control: A Case Study of Russia**

R. Ramesh, **R. Sundara Raman**, M. Bernhard, V. Ongkowijaya, L. Evdokimov, A. Edmundson, S. Sprecher, M. Ikram, R. Ensafi

Network and Distributed System Security Symposium (NDSS), February 2020

🏆 CSAW'20 Applied Research Competition North America Top 10 Paper

🔗 <https://ramakrishnansr.com/assets/russia.pdf>

Talks

- **Workshop Talk: Advancing the Art of Censorship Data Analysis**

Free and Open Communications on the Internet (FOCI), February 2023

- **Lightning Talk: Exploring Internet censorship through the Censored Planet Dashboard**

Open Technology Fund (OTF), January 2023

- **Conference Talk: Network Measurement Methods for Locating and Examining Network Censorship Devices**

Conference on emerging Networking EXperiments and Technologies (CoNEXT 2022), December 2022

- **Workshop Talk: Improving Usability of Internet Censorship Data through a Censorship Dashboard**

15th Workshop on Hot Topics in Privacy Enhancing Technologies (HotPETs), July 2022

🏆 Best Talk Award

- **Tech Demo: Exploring Internet censorship with the Censored Planet Dashboard**

RightsCon 2022, June 2022

🔗 <https://youtu.be/j1sLWAmOnMA>

- **Symposium Talk: Censored Planet: An Internet-wide, Longitudinal Censorship Observatory**

The 5th Annual Data for Public Good Symposium, March 2022

🔗 <https://midas.umich.edu/2022-d4pg/research-talks/#research-talks>

- **Invited Talk: Censored Planet Community Webinar 2021**

Censored Planet, October 2021

🔗 https://youtu.be/v5G_nUUzVv8

- **Invited Talk: Censored Planet: An Internet-wide Longitudinal Observatory**

NDSS DNS Privacy Workshop (DNSPriv), February 2021

- **Conference Talk: Censored Planet: An Internet-wide Longitudinal Observatory**
ACM Conference on Computer and Communications Security (CCS), November 2020
<https://youtu.be/8dwZdNkJ508>
- **Conference Talk: Investigating Large Scale HTTPS Interception in Kazakhstan**
ACM Internet Measurement Conference (IMC), October 2020
<https://youtu.be/RoYWsfN0Cr4>
- **Invited Talk: Censored Planet: Measuring Internet censorship remotely**
OONI Internet Measurement Village (IMV), June 2020
<https://youtu.be/5IgvR42cMQ>
- **Conference Talk: Measuring the Deployment of Network Censorship Filters at Global Scale**
Network and Distributed System Security Symposium (NDSS), February 2020
<https://youtu.be/R8VlH0wakQk>

Posters

- **Censored Planet: An Internet-wide, Longitudinal Censorship Observatory**
Midwest Security Workshop, April 2019
- **Measuring Last Mile Internet Reliability During Severe Weather**
ACM Internet Measurement Conference (IMC), November 2017

Awards

Research	■	IRTF Applied Networking Research Prize (ANRP) 2023 January 2023 https://www.ietf.org/blog/anrp-2023/
	■	HotPETs 2022 Best Talk Award July 2022 https://petsymposium.org/best-hotpets-talks.php
	■	University of Michigan CSE Graduate Student Honors Runners Up Award November 2020 https://cse.engin.umich.edu/stories/2020-cse-graduate-student-honors-competition-highlights-outstanding-research
	■	ACM IMC 2020 Best Paper Award Nominee October 2020
Fellowships	■	Rackham Predoctoral Fellowship March 2023 https://cse.engin.umich.edu/stories/ram-sundara-raman-earns-rackham-predoctoral-fellowship
	■	OTF Information Controls Fellowship (ICFP) Award November 2021 https://www.opentech.fund/about/people/ramakrishnan-sundara-raman/
Teaching & Service	■	North Campus Deans' MLK Spirit Award 2023 January 2023 https://culture.engin.umich.edu/2023-nominees-recipients/
	■	University of Michigan CSE GSI Honorable Mention Award August 2021 https://ramakrishnansr.com/images/honorable_mention_award.pdf
Grants	■	ACM IMC 2022 Travel Grant October 2022
	■	DARPA MICE Grant Title: Leveraging machine learning to build an intelligent Censored Planet observatory August 2021

- **USENIX Security 2020 Student Grant**
August 2020
- **Citizen Lab Summer Institute (CLSI) 2019 Travel Grant**
August 2019

Teaching

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| March 2023 | ■ Guest Lecturer, CS 4973, Northeastern University
Topic: Censorship and Circumvention |
| January 2023 – April 2023 | ■ Substitute Instructor, EECS 588, University of Michigan
Topic: Computer and Network Security |
| March 2022 | ■ Guest Lecturer, EECS 588, University of Michigan
Topic: Censorship and Circumvention |
| August 2020 – December 2020 | ■ Graduate Student Instructor (GSI), EECS 588, University of Michigan
Topic: Computer and Network Security
🏆 GSI Honorable Mention Award |

Reports and Blogposts

- **Profiling Internet Censors: Methods to Measure and Locate Censorship Devices**
Open Technology Fund (OTF), December 2022
🔗 <https://www.opentech.fund/news/profiling-internet-censors-methods-to-measure-and-locate-censorship-devices/>
- **An analysis of a large-scale HTTPS interception**
APNIC Blog, February 2021
🔗 <https://blog.apnic.net/2021/02/15/an-analysis-of-a-large-scale-https-interception/>
- **US Government and military websites are geoblocked from Hong Kong and China**
Censored Planet, August 2020
🔗 <https://censoredplanet.org/hongkong>

Service

- | | |
|-------------------|---|
| Session Chair | ■ Session Chair at FOCI'21
I served as the session chair for the HTTPS censorship session at the ACM SIGCOMM 2021 Workshop on Free and Open Communications on the Internet (FOCI 21).
🔗 https://conferences.sigcomm.org/sigcomm/2021/workshop-foci.html |
| Reviewer | ■ Reviewer at CSAE '22
I served as a reviewer for the 6th International Conference on Computer Science and Application Engineering (CSAE).
■ PC Member at FOCI'21
I served as a technical program committee member for ACM SIGCOMM 2021 Workshop on Free and Open Communications on the Internet (FOCI 21).
🔗 https://conferences.sigcomm.org/sigcomm/2021/workshop-foci.html |
| External Reviewer | ■ USENIX Security Symposium 2022
■ ACM Internet Measurement Conference (IMC) 2021
■ USENIX Security Symposium 2021
■ ACM Internet Measurement Conference (IMC) 2020
■ IEEE Symposium on Security and Privacy 2020
■ Privacy Enhancing Technology Symposium (PETS) 2020
■ Usenix Security Symposium 2019 |

■ **IEEE Symposium on Security and Privacy 2019**

Leadership

■ **Outreach Chair at CSEG**

June 2020 – May 2022

I worked as the Outreach Chair at my department's graduate student organization. My responsibilities included arranging and managing outreach events throughout the year that aimed at spreading knowledge about computer science research in various schools, colleges and groups. I also participated as the DEI committee student representative in the first few months of 2022.

References

Roya Ensafi, Assistant Professor, University of Michigan