

Ramakrishnan Sundara Raman

PhD Candidate, University of Michigan

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I am a PhD candidate with 5+ years of experience in computer security and networking research, with expertise in using Internet measurement methods to detect, analyze and prevent large-scale threats to Internet users' security and privacy. 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, and I am the recipient of an OTF Information Controls Fellowship, Rackham Predoctoral Fellowship, and an IRTF Applied Networking Research Prize.

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
- 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.**
 - Engineered telemetry tools to identify anomalous network events in large amounts of network traffic.
 - Developed network data analysis tools for detecting large-scale traffic tampering from an operator's point of view.
 - Built live visualization dashboards and reports showcasing significant network events.
- November 2021 – July 2022 📌 **OTF Senior ICFP Fellow in Information Controls, The Citizen Lab**
 - Researched novel measurement methods for locating and examining network devices that performed surveillance and censorship.
 - Published several open-source tools and fingerprint datasets for identifying censorship devices.
- August 2020 – December 2020 📌 **Graduate Student Instructor, University of Michigan**
Lead graduate student instructor for EECS 588 - the graduate level computer and network security course at the University of Michigan.
- July 2017 – May 2018 📌 **Associate Consultant, Microsoft Global Delivery**
Contributed to enterprise systems for business applications that can deliver value to large organizations around the world.
- March 2017 – July 2017 📌 **Research Intern, University of Maryland**
Advisor: Prof. Neil Spring
 - Facilitated a measurement platform that identifies last-mile residential Internet outages in areas affected by severe weather conditions.
 - Developed analysis tools and a live visualization dashboard that demonstrated current outages across the United States.
 - Poster presented at ACM Internet Measurement Conference 2017: "Measuring Last-Mile Internet Reliability During Severe Weather"
- May 2016 – July 2016 📌 **Intern, Microsoft Global Delivery**
Integrated data analytics into Microsoft's project management tool, built on ASP.NET. Microsoft's Power BI tool was utilized to make interactive reports that provided valuable insight to the users.

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](https://ramakrishnansr.com/assets/russia-ukraine-invasion.pdf)
- **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
[🔗 https://ramakrishnansr.com/assets/certainty.pdf](https://ramakrishnansr.com/assets/certainty.pdf)
- **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](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](https://ramakrishnansr.com/assets/censorship_devices.pdf)
- **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](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](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](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](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](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](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](https://ramakrishnansr.com/assets/russia.pdf)

*Both authors contributed equally to this research

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

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/RoYWsfnOCr4>
- **Invited Talk: Censored Planet: Measuring Internet censorship remotely**
OONI Internet Measurement Village (IMV), June 2020
<https://youtu.be/5IgvnR42cMQ>
- **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

Teaching

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

- **Making Censorship Data More User Friendly**
Internet Society Pulse Blog, May 2023
<https://pulse.internetsociety.org/blog/making-censorship-data-more-user-friendly>
- **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

Chairing	■ Session Chair at FOCI'21 https://conferences.sigcomm.org/sigcomm/2021/workshop-foci.html
Reviewing	■ TPC Member, IEEE Symposium on Security and Privacy (S&P) 2024 https://sp2024.ieee-security.org/cfpapers.html
	■ Reviewer, 6th International Conference on Computer Science and Application Engineering (CSAE) 2022
	■ TPC Member, ACM SIGCOMM 2021 Workshop on Free and Open Communications on the Internet (FOCI 21) https://conferences.sigcomm.org/sigcomm/2021/workshop-foci.html
External Reviewing	■ 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 (S&P) 2020
	■ Privacy Enhancing Technology Symposium (PETS) 2020
	■ USENIX Security Symposium 2019
	■ IEEE Symposium on Security and Privacy (S&P) 2019
Leadership	■ Outreach Chair at CSEG, graduate student organization June 2020 – May 2022 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 of CSEG in the first few months of 2022.

References

Roya Ensafi, Assistant Professor, University of Michigan