

Ramakrishnan Sundara Raman

PhD Candidate, University of Michigan

✉ ramaks@umich.edu

🔗 <https://ramakrishnansr.com/>

🌐 [ramakrishnansundararaman](#)

📅 Updated: 07 September 2023

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. 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 a FOCI Rising Star Award, an OTF Information Controls Fellowship, a 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

Conference Publications

- **Modeling and Detecting Internet Censorship Events**
E. Tsai, R. Sundara Raman, A. Prakash, R. Ensafi
Network and Distributed System Security Symposium (NDSS), February 2024
- **Global, Passive Detection of Connection Tampering**
R. Sundara Raman, L.H. Merino, K. Bock, M. Fayed, D. Levin, N. Sullivan, L. Valenta
ACM SIGCOMM, September 2023
🔗 <https://ramakrishnansr.com/assets/passive.pdf>
- **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>
- **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>
- **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
- **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>

*Both authors contributed equally to this research

- **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>

Workshop Publications

- **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>
- **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>

Awards

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| Research | <ul style="list-style-type: none"> 📌 FOCI'23 Rising Star Award
July 2023
https://ramakrishnansr.com/images/foci-rising-star.jpeg 📌 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 |
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Fellowships	<div> <div> </div> <div> Rackham Predoctoral Fellowship March 2023 https://cse.engin.umich.edu/stories/ram-sundara-raman-earns-rackham-predoctoral-fellowship </div> </div>
	<div> <div> </div> <div> OTF Information Controls Fellowship (ICFP) Award November 2021 https://www.opentech.fund/about/people/ramakrishnan-sundara-raman/ </div> </div>
Teaching & Service	<div> <div> </div> <div> North Campus Deans' MLK Spirit Award 2023 January 2023 https://culture.engin.umich.edu/2023-nominees-recipient/ </div> </div>
	<div> <div> </div> <div> University of Michigan CSE GSI Honorable Mention Award August 2021 https://ramakrishnansr.com/images/honorable_mention_award.pdf </div> </div>
Grants	<div> <div> </div> <div> ACM IMC 2022 Travel Grant October 2022 </div> </div>
	<div> <div> </div> <div> DARPA MICE Grant Title: Leveraging machine learning to build an intelligent Censored Planet observatory August 2021 </div> </div>
	<div> <div> </div> <div> USENIX Security 2020 Student Grant August 2020 </div> </div>
	<div> <div> </div> <div> Citizen Lab Summer Institute (CLSI) 2019 Travel Grant August 2019 </div> </div>

Teaching

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

Work Experience

July 2022 – September 2022	<div> <div> </div> <div> Research Intern, Cloudflare Inc. <ul style="list-style-type: none"> Designed and implemented a large network monitoring system that identifies anomalous network events such as connection tampering attacks in large-scale network traffic at the rate of millions of packets per second. Developed network data analysis methods and tools for detecting large-scale traffic tampering passively from an operator's point of view. Built production dashboards and reports showcasing significant network events such as the effects of the protests in Iran on Internet traffic. </div> </div>
November 2021 – July 2022	<div> <div> </div> <div> OTF Senior ICFP Fellow in Information Controls, The Citizen Lab <ul style="list-style-type: none"> Researched novel measurement methods for locating and examining network devices that performed surveillance and censorship. Collaborated with the expert team at the Citizen Lab, a research group focused on network forensics. Published several open-source tools and fingerprint datasets for identifying censorship devices. </div> </div>

- July 2017 – May 2018

Associate Consultant, Microsoft Global Delivery

Contributed to large 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 and analysis tools that identifies last-mile residential Internet outages in areas affected by severe weather conditions in real-time.
 - 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.

Mentoring

- **Undergraduate Students:** Nadav Oren (2023), Yusei Uehara (2023), Gavin Li (2021 - 2023), Apurva Virkud (2020 - 2022), Anjali Vyas (2020 - 2021), Rose Ceccio (2020 - 2021), Prerana Shenoy (2019 - 2020), Victor Ongkowijaya (2018 - 2019), Adrian Stoll (2018 - 2019)
- **Graduate Students:** Kevin Wang (2023), Shreyas Chandrashekar (2023), Kyle Astroth (2023), Anna Ablove (2022 - 2023), Elisa Tsai (2020 - 2023)

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>

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>

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

Certifications

- **2023 Rackham-CRLT Preparing Future Faculty Seminar**
University of Michigan, June 2023
<https://ramakrishnansr.com/assets/pff2023.pdf>
- **Introduction to Data Science in Python**
University of Michigan Coursera, June 2023
<https://ramakrishnansr.com/assets/coursera-intro-data-science-python.pdf>

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) 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, UM CSE 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.
🏆 Deans' MLK Spirit Award 2023
- 📖 **Administrator of the Security Reading Group (SECRIT) in UM CSE**
June 2019 – June 2021

References

Roya Ensafi, Associate Professor, University of Michigan
 J. Alex Halderman, Professor, University of Michigan
 Marwan Fayed, Research Manager, Cloudflare
 Eric Wustrow, Associate Professor, University of Colorado Boulder