Ramakrishnan Sundara Raman

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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

Conference Publications

- **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

- **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

- **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

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[*]Both authors contributed equally to this research

- **Censored Planet: An Internet-wide, Longitudinal Censorship Observatory**
  <u>R. Sundara Raman</u>, 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**
  <u>R. Sundara Raman</u>, 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**
  <u>R. Sundara Raman</u>, 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, <u>R. Sundara Raman</u>, 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**
  <u>R. Sundara Raman</u>, 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, <u>R. Sundara Raman</u>, 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

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

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

Work Experience

July 2022 – September 2022	**Research Intern, Cloudflare Inc.**
	▬ 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.
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.
	▬ 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.
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**

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:** Yusei Uehara (2023), Gavin Li (2021 - 2023), Apurva Virkud (2020 - 2022), Anjali Vyas (2020 - 2021), Nick Ceccio (2020 - 2021), Prerana Shenoy (2019 - 2020), Victor Ongkowijaya (2018 - 2019), Adrian Stoll (2018 - 2019)

- **Graduate Students:** Shreyas Chandrashekaran (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/5IgnvR42cMQ

- **Conference Talk: Measuring the Deployment of Network Censorship Filters at Global Scale**
  Network and Distributed System Security Symposium (NDSS), February 2020
  🔗 https://youtu.be/R8VlHOwakQk

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, Assistant Professor, University of Michigan