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. My expertise lies in building empirical methods to detect, analyze and prevent large-scale security and privacy threats to Internet users. My research involves longitudinally measuring Internet censorship and connection tampering at global scale, and examining the technologies that enable tampering. I am a lead researcher for the Censored Planet Observatory, and I am the recipient of a FOCI Rising Star Award, an OTF Information Controls 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 Restrictions
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

○ **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

○ **CERTainty: 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

○ **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

○ **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

○ **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

○ **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

○ **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

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[*]Both authors contributed equally to this research

○ **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

○ **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

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

○ **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

Awards

Research	🔖	**FOCI'23 Rising Star Award** 🔗 July 2023
	🔖	**IRTF Applied Networking Research Prize (ANRP) 2023** 🔗 January 2023
	🔖	**University of Michigan CSE Graduate Student Honors Runners Up Award** 🔗 November 2020
	🔖	**ACM IMC 2020 Best Paper Award Nominee** October 2020
Fellowships & Grants	🔖	**Rackham Predoctoral Fellowship** 🔗 March 2023
	🔖	**OTF Information Controls Fellowship (ICFP)** 🔗 November 2021
	🔖	**Travel Grants–ACM IMC 2022, USENIX Security 2020, and Citizen Lab Summer Institute 2019**
Teaching & Service	🔖	**North Campus Deans' MLK Spirit Award 2023** 🔗 January 2023
	🔖	**University of Michigan CSE GSI Honorable Mention Award** 🔗 August 2021

Teaching

March 2023	🔖	**Guest Lecturer, CS 4973, Northeastern University** Topic: Censorship and Circumvention
January 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 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**
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**
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), Apurva Virkud (2020 - 2022), Anjali Vyas (2020 - 2021), Prerana Shenoy (2019 - 2020)

- **Graduate Students:** Kevin Wang (2023), Elisa Tsai (2020 - 2023)

Talks

- **Invited Talk: Network Measurement Methods for Locating and Examining Network Censorship Devices** 🔗
  IETF 118, November 2023

- **Conference Talk: Global, Passive Detection of Connection Tampering** 🔗
  ACM SIGCOMM, September 2023

- **Conference Talk: Network Responses to Russia's Invasion of Ukraine in 2022: A Cautionary Tale for Internet Freedom**
  Usenix Security Symposium, August 2023

- **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

- **Tech Demo: Exploring Internet censorship with the Censored Planet Dashboard** 🔗
  RightsCon 2022, June 2022

- **Symposium Talk: Censored Planet: An Internet-wide, Longitudinal Censorship Observatory**
  The 5th Annual Data for Public Good Symposium, March 2022

- **Invited Talk: Censored Planet Community Webinar 2021** 🔗
  Censored Planet, October 2021

- **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

- **Conference Talk: Investigating Large Scale HTTPS Interception in Kazakhstan** 🔗
  ACM Internet Measurement Conference (IMC), October 2020

- **Invited Talk: Censored Planet: Measuring Internet censorship remotely** 🔗
  OONI Internet Measurement Village (IMV), June 2020

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

Reports and Blogposts

- **Measuring Connection Tampering Around the World**
  Internet Society Pulse Blog, October 2023
  🔗 https://pulse.internetsociety.org/blog/measuring-connection-tampering-around-the-world

- **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

- **Introduction to Data Science in Python** 🔗
  University of Michigan Coursera, June 2023

Service

Chairing	**Session Chair at Free and Open Communications on the Internet (FOCI) 2021** 🔗
Reviewing	**TPC Member, IEEE Symposium on Security and Privacy (S&P) 2024** 🔗
	TPC Member, ACM Internet Measurement Conference (IMC) 2024
	TPC Member, Free and Open Communications on the Internet (FOCI) 2024 🔗
	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) 🔗
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 early 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, Bredt Family Professor, University of Michigan
Eric Wustrow, Associate Professor, University of Colorado Boulder
Dave Levin, Associate Professor, University of Maryland
Marwan Fayed, Research Manager, Cloudflare Research