Sathvik N. Prasad

Computer Security and Applied ML Researcher

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Professional Summary

- 9+ years of cumulative experience in Computer Security, Machine Learning, NLP, Networking, and Software Development. Expertise in conceptualizing and developing large-scale data collection systems and novel data processing pipelines to study spam, fraud, and abuse. PhD research involved designing and operating the largest academic telephony honeypot in the US and developing innovative techniques to study scam calls (also called **robocalls**) and phishing SMS messages.
- Data collection techniques from my research on robocalls have driven the **FCC's regulatory policy** on protecting millions of phone users across the US from fraudulent robocalls. Demonstrated real-world impact through industry-academia collaborations which led to multiple publications at top security conferences (USENIX Security, IEEE S&P, CCS), press coverage spanning 60+ articles, 20+ invited talks and panel discussions at industry and academic forums.
- Recipient of the prestigious **Internet Defense Award** (1^{st} place, $100,000) which recognizes security research that meaningfully contributes to the protection and defense of the Internet. Recipient of two **Distinguished Paper Awards** (USENIX Security & CCS), **Distinguished Artifact Award** (CCS) and **Best Poster Presentation Award** (NDSS).

Employment & Experience

Research Assistant, WSPR Lab, NCSU — Aug '19 – Present

Led the design, development and operation of the **Robocall Observatory** infrastructure — a honeypot of 66,000 phone numbers spread across the US, which collected over 10 Million robocalls over six years. Used audio fingerprints and **audio-LM** based embeddings to aggregate similar-sounding robocalls into campaigns with 95% accuracy. Leveraged **semi-supervised learning** and **NLP** techniques to expose deceptive tactics of fraudulent robocallers responsible for millions of dollars in damages to victims. Extracted robocall **threat intelligence** from enforcement reports and consumer complaints. Measured the prevalence of `STIR/SHAKEN` **call authentication** framework. Published six papers, winning multiple awards.

Data Science Intern, The Industry Traceback Group (ITG) — May '23 – Aug '23

I was part of the Data Science group within the FCC-designated body that identifies the source of illegal robocalls. Fine-tuned the scoring system of the inaugural version of **Traceback Insights** initiative, which is being used by regulators, enforcement agencies, and 1,000+ service providers worldwide to track the point of origin of illegal robocalls. Also developed NLP pipelines that provide a consistent and holistic view of robocall campaigns across multiple robocall feeds automatically.

Data Science Intern, Google/Mandiant — May '22 – Sept '22

Worked with the research team to develop fine-tuning pipelines for open-source code Large Language Models (**code-LLMs**). Trained LLM-based classifiers to identify potentially malicious source code across 10+ programming languages.

Fraud Analyst Intern, Bandwidth — May '21 – Aug '21

Developed internal tools using sentence embeddings models (`S-BERT`) and NLP techniques to aid the fraud team in detecting and mitigating fraudulent messaging traffic. Delivered internal training sessions on blocking fraudulent traffic.

Engineering Intern, CenturyLink — June '19 – Aug '19

Developed automated configuration and change deployment system for Avaya VoIP systems deployed across the US.

Software Development Engineer, Cisco Systems — Oct '17 – July '18

Developed numerous features for Cisco's enterprise VoIP application suite. Specialized in triaging, recreating and addressing critical software defects and security flaws affecting customer deployments across the globe, serving millions of users.

Technical Services Engineer, Cisco Systems — July '15 – Sept '17

Troubleshot some of the world's largest VoIP networks which process millions of calls, uncovered security flaws in VoIP products and worked with product teams to fix critical bugs. Developed widely used internal productivity enhancing tools.

Intern, Cisco Systems Jan '15 – July '15
Won the Innovation Award for developing a tool called *MagicTrace*. It drastically simplified troubleshooting tasks for critical phone networks by reducing the time taken to identify failed calls from hundreds of hours to a few minutes.

Summer Research Fellow, Indian Institute of Science June '14 – July '14
Benchmarked evolutionary algorithms against other optimization techniques to solve antenna array positioning problems.

Education

M.S., Ph.D. in Computer Science, North Carolina State University 2018 – 2025 (est.)
Dissertation Title: "Systems and Techniques to Characterize Robocalls"
Advisor: Dr. Bradley Reaves; Committee: Dr(s): William Enck, Alexandros Kapravelos, Anupam Das

B. E. in Electronics and Communication, R.V. College of Engineering, India 2011 – 2015

Publications

1. **Characterizing Robocalls with Multiple Vantage Points**, To appear in IEEE S&P (Oakland), 2025
   Sathvik Prasad, Aleksandr Nahapetyan, Bradley Reaves, acceptance rate = 14.3%
2. **Jäger: Automated Telephone Call Traceback**, ACM CCS, 2024
   David Adei, Varun Madathil, Sathvik Prasad, Bradley Reaves, Alessandra Scafuro, acceptance rate = 17%
   🏆 *Distinguished Paper Award* 🏆 *Distinguished Artifact Award*
3. **On SMS Phishing Tactics and Infrastructure**, IEEE S&P (Oakland), 2023
   Aleksandr Nahapetyan, Sathvik Prasad, Kevin Childs, Adam Oest, Yeganeh Ladwig, Alexandros Kapravelos, Bradley Reaves, acceptance rate = 17%
4. **Diving into Robocall Content with SnorCall**, USENIX Security, 2023
   Sathvik Prasad, Trevor Dunlap, Alexander Ross, Bradley Reaves, acceptance rate = 29%
5. **Who's Calling? Characterizing Robocalls through Audio and Metadata Analysis**, USENIX Security, 2020
   Sathvik Prasad, Elijah Bouma-Sims, Athishay Kiran Mylappan, Bradley Reaves, acceptance rate = 16%
   🏆 *1st Prize — Internet Defense Award ($100,000)* 🏆 *Distinguished Paper Award*
6. **Thou Shalt Discuss Security: Quantifying the Impacts of Instructions to RFC Authors**, SSR, 2019
   Justin Whitaker, Sathvik Prasad, Bradley Reaves, and William Enck, acceptance rate = 35%

Technical Reports, Workshop Presentations, Online Articles, and Posters

1. **Non English Robocalls: What Are They Saying?** Consumer Protection Workshop (ConPro 2024)
   Sathvik Prasad, Bradley Reaves
2. **Robocall Audio from the FTC's Project Point of No Entry**, Technical Report, TR-2023-1
   Sathvik Prasad, Bradley Reaves
3. **Diving into Robocall Content with SnorCall**, USENIX ;login: (Online Article), 2023
   Sathvik Prasad, Bradley Reaves
4. **Does ignoring robocalls make them stop? Here's what we learned from getting 1.5 million calls on 66,000 phone lines.** The Conversation (Online Article), 2020
   Sathvik Prasad, Bradley Reaves
5. **Poster: Diving into Robocall Content with SnorCall**, NDSS, Feb 2023
   Sathvik Prasad, Trevor Dunlap, Alexander Ross, Bradley Reaves
6. **Poster: Diving into Robocall Content with SnorCall**, NCAE Colloquium, Sept 2023
   Sathvik Prasad, Trevor Dunlap, Alexander Ross, Bradley Reaves

7. **Poster: Who's Calling? Characterizing Robocalls through Audio and Metadata Analysis**, NDSS, Feb 2020
   Sathvik Prasad, Elijah Bouma-Sims, Athishay Kiran Mylappan, Bradley Reaves
   🏆 *Best Poster Presentation Award*
8. **Poster: Who's Calling? Characterizing Robocalls through Audio and Metadata Analysis**, TAPS, Oct 2019
   Sathvik Prasad, Elijah Bouma-Sims, Athishay Kiran Mylappan, Bradley Reaves

Awards & Honors

Distinguished Paper Award at ACM CCS	2024
Distinguished Artifact Award at ACM CCS	2024
Student Travel Grant to attend ACM CCS	2024
Selected to present my research at the National Cybersecurity Education Colloquium	2023
Nominated for the Carla Savage Award for outstanding service, NCSU	2023
Computer Science Graduate Student Leadership Award, NCSU	2021
Facebook Internet Defense Award at USENIX Security – 1^{st} Prize ($100,000)	2020
Distinguished Paper Award at USENIX Security (top 1% of accepted papers)	2020
Best Poster Presentation Award at NDSS	2020
Student Travel Grant to attend NDSS	2020
Cisco Operational Excellence Award	2017
Cisco Early Career Network Achiever Award	2017
Cisco CLEAD Award for Innovation	2015

Service

Program Committee – IEEE S&P	2025
Program Committee – IEEE S&P and ACNS	2024
Program Committee – WiSec, Artifact Evaluation Committee – WiSec	2023
Artifact Evaluation Committee – ACSAC and WiSec, Poster Jury Committee – IEEE S&P	2022
External Reviewer – USENIX Security, NDSS and PAM Conference	2021

Invited Talks, Interviews & Lectures

1. **SMS Phishing: Tactics and Infrastructure**
   Sept 2024 – SIPNOC (co-presented with Dr. Brad Reaves), *Invited Talk*
2. **Diving into Robocall Content with SnorCall**
   Nov 2023 – Triangle Area Privacy and Security (TAPS), UNC Chapel Hill, *Invited Talk*
   Aug 2023 – USENIX Security, *Conference Presentation*
   Aug 2023 – J.P. Morgan AI Research, *Invited Talk*
3. **Systems and Techniques to Characterize Robocalls**
   Sep 2023 – National Cybersecurity Education Colloquium, *Panel, Poster and Research Presentation*
4. **Robocalls and Call Authentication**
   Aug 2023 – The Commsrisk Show, *Invited Panelist*
5. **How to Extract Insights by Analyzing Millions of Robocall Audio Recordings**
   Oct 2023 – Transaction Network Services, *Invited Talk*
   Sep 2023 – SIPNOC (co-presented with Dr. Brad Reaves), *Invited Talk*
   July 2023 – The FTC, FCC, State AGs, and other government agencies, *Research Talk*
   July 2023 – Verizon, *Research Talk*
   May 2023 – Resideo, *Invited Talk*

6. **Fraud, Spam, Robocalls and the International Dimension**
   Apr 2022 – Risk and Assurance Group Conference, New Orleans, *Invited Panelist*
7. **Who's Calling? Characterizing Robocalls through Audio and Metadata Analysis**
   Feb 2021 – Duke Privacy and Security Seminar, Duke University, *Invited Talk*
   Dec 2020 – University of Michigan, *Invited In-class Discussion*
   Oct 2020 – Bandwidth Inc. *Internal Company-wide Talk*
   Sep 2020 – The George Washington University, *Invited Talk*
   Aug 2020 – University of Wisconsin-Madison *Invited Talk*
   Aug 2020 – USENIX Security Symposium, *Invited Talk*
8. **Class Lectures**
   Apr 2024 – Systems and Techniques to Characterize Robocalls, *CSC 574 (Computer & Network Security)*
   Sep 2021 – Key Management, Key Distribution and Certificates, *CSC 574 (Computer & Network Security)*
   Jan 2021 – Security Fundamentals - A Comprehensive Review, *CSC 791 (Cellular Network Security)*

Select Media Coverage (60+ news articles)

- *Facebook Research Press Release* – Facebook Internet Defense Award Winners
- *NC State News* – A New Weapon in the War on Robocall Scams
- *NC State News* – Study Sheds Light on Shady World of Text Message Phishing Scams
- *ACM Communications* – Study Examines Robocall Strategies and Techniques for Stopping Them
- *Newsobserver* – Tired of robocalls? NC State, Bandwidth team up in search of solutions
- *WRAL Article* – Fight against robocalls is making progress, NCSU study finds
- *Bruce Schneier's Blog* – Robocall Results from a Telephony Honeypot
- *NC State Press Release* – Study Debunks Robocall Myths, Lays Groundwork for Stopping Them
- *NC State Magazine* – Who's calling? Computer Science Researchers get to the Bottom of Robocalls
- *ZDNet* – A simple telephony honeypot received 1.5 million robocalls across 11 months
- *Engadget* – Research shows answering one robocall doesn't lead to more
- *Bandwidth Inc.* – Bandwidth Partners with NC State University on Rigorous Robocalling Study
- *NASDAQ* – Bandwidth Partners with NC State University on Rigorous Robocalling Study
- *Yahoo Money* – Bandwidth Partners with NC State University on Rigorous Robocalling Study
- *Business Insider* – Bandwidth Partners with NC State University on Rigorous Robocalling Study
- *Yahoo News* – Does ignoring robocalls make them stop?
- *The Chronicle of Higher Education* – A thank you note in the daily briefing

Expertise & Skills

Programming Languages	Python, C
Tools and Protocols	LaTeX, Git, Wireshark, Audacity, MongoDB, Cisco Routing, Switching & Troubleshooting (CCNP – expired), vCenter, Proxmox, TCP/IP, DNS, HTTP(s), TLS, SIP, RTP
ML Techniques	Semi-Supervised Learning, Clustering, Natural Language Processing, Transformer-based models, Speech Processing, Anomaly Detection, Time Series Analysis
Relevant Courses	Computer and Network Security, Advanced Network Security, Operating Systems, Cellular Network Security, Algorithms, Natural Language Processing

Community Outreach

08/2019 – 04/2020	**Campus Lead**, India Student Hub, USA Organized a university-wide poster presentation and a gathering with the Embassy of India Science and Technology Counselor at North Carolina State University.
2019 – 2022 (4 years)	**Small Pack Leader**, North Carolina State University As a student volunteer for the Office of International Services, I have collectively led over 150 new incoming graduate students from more than 15 countries. My responsibility was to help these international graduate students transition from their home country to an academic life at NC State.

Leadership and Mentoring

- As the lead graduate student for the Wolfpack Security and Privacy Research lab (7 faculty, 30+ students), I was responsible for administering research infrastructure, co-ordinating lab logistics, hosting visitors, and representing the security lab in department-wide public events.
- I've mentored multiple undergraduate, masters and early-stage PhD students in the WSPR lab. I've also mentored three new hires during my time at Cisco, and was responsible for developing a comprehensive new-hire training plan.