Soundarya Ramesh

(Last Updated: April, 2025)

RESEARCH SUMMARY

My research focuses on sensor signal processing to solve impactful problems, with an emphasis on enhancing user privacy. Throughout my PhD, I have explored the potential of *audio and wireless signals* for developing robust authentication methods, identifying novel attack vectors, and designing effective defenses against speech eavesdropping. My PhD research was recognized with the prestigious Google PhD Fellowship. Moving forward, I aim to tackle complex sensing challenges, using signal processing and machine learning techniques, in various application domains. I am especially drawn to interdisciplinary research with societal relevance.

CONTACT

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WORK EXPERIENCE

Postdoctoral Researcher, National University of Singapore   *Jan 2025 – Present*
Topics – Multi-modal Sensing, Human Computer Interaction, Drone Audition
Advisor : Suranga Nanayakkara

Research Intern, Augmented Language Team in Google, Mountain View   *May-Aug 2022*
Topic – Speech Processing for Augmented Reality Glasses
Advisors : Chiong Lai, Mathieu Parvaix, Alex Olwal

EDUCATION

National University of Singapore   *Aug 2018 – Jan 2025*
Ph.D. in Computer Science   *Current GPA : 4.92/5*
Advisors – Jun Han and Chan Mun Choon
Topic – Duality of Microphone Privacy: New Threats and Improved Defenses

National Institute of Technology Karnataka, India   *Aug 2014 – May 2018*
Bachelor of Technology in Information Technology   GPA : 9.01/10

CONFERENCE PAPERS

- Enhancing LoRa Reception with Generative Models: Channel-Aware Denoising of LoRaPHY Signals. Kanav Sabharwal, Soundarya Ramesh, Jingxian Wang, Dinil Mon Divakaran, Chan Mun Choon. **ACM SenSys 2024**.

- *MagTracer*: Detecting GPU Cryptojacking Attacks via Magnetic Leakage Signals.
  Rui Xiao, Tianyu Li, Soundarya Ramesh, Jun Han, Jinsong Han. **ACM MobiCom 2023**.

- *TickTock*: Detecting Mic Status in Laptops Leveraging Electromagnetic Leakage of Clock Signals.
  Soundarya Ramesh, Ghozali Hadi, Sihun Yang, Chan Mun Choon, Jun Han. **ACM CCS 2022**.

- Acoustics to the Rescue: Physical Key Inference Attack Revisited.
  Soundarya Ramesh, Rui Xiao, Anindya Maiti, Jong Taek Lee, Harini Ramprasad, Ananda Kumar, Murtuza Jadliwala, Jun Han. **USENIX Security 2021**.

- Neuro-Symbolic Execution: Augmenting Symbolic Execution with Neural Constraints.
  Shen Shiqi, Shweta Shinde, Soundarya Ramesh, Abhik Roychoudhury, Prateek Saxena. **NDSS 2019**.

WORKSHOP PUBLICATIONS

- *Your Mic Leaks Too Much*: A Double-Edged Sword for Security
  Soundarya Ramesh. **ACM MobiSys Rising Stars 2024**.
  Best Presentation Award

- *RampScope*: Ramp-level Localization of Shared Mobility Devices using Sidewalk Ramps.
  Jonghyuk Yun*, Gyuyeon Kim*, Soundarya Ramesh, Jun Han. **ACM HotMobile 2023**.

- Listen to Your Key: Towards Acoustics-based Physical Key Inference.
  Soundarya Ramesh, Harini Ramprasad, Jun Han. **ACM HotMobile 2020**.
  Media Coverage: ACM News, Forbes, Scientific American, HackerNews, Mashable and over 25,000 views on YouTube

- *SoundUAV*: Towards Delivery Drone Authentication via Acoustic Noise Fingerprinting.
  Soundarya Ramesh, Thomas Pathier, Jun Han. **ACM DroNet 2019**.

JOURNALS / INDUSTRY CONFERENCES

- *PADrone*: Pre-flight Abnormalities Detection on Drone via Deep RF Sensing.
  Ghozali Hadi, Soundarya Ramesh, Chan Mun Choon. **ACM TIOT 2025**.

- *RollBack*: A New Time-Agnostic Replay Attack Against the Automotive Remote Keyless Entry Systems.
  Levente Csikor, Hoon Wei Lim, Jun Wen Wong, Soundarya Ramesh, Rohini Poolat Parameswarath, Chan Mun Choon. **Black Hat USA 2022**.

POSTERS

- *RampScope*: Ramp-level Localization of Shared Mobility Devices using Sidewalk Ramps.
  Jonghyuk Yun*, Gyuyeon Kim*, Soundarya Ramesh, Jun Han. **ACM HotMobile 2023**.
  Best Poster Award

- *SoundUAV*: Fingerprinting Acoustic Emanations for Delivery Drone Authentication.
  Soundarya Ramesh, Thomas Pathier, Jun Han. **ACM MobiSys 2019**.
  Best Poster Runner-up Award

HONORS AND AWARDS

- *Google PhD Fellowship* (under *Mobile Computing* research area)   *2021-2024*
- *Best Presentation Award at the Rising Stars Forum, ACM MobiSys*   *2024*
- *NUS School of Computing Dean's Graduate Research Achievement Award*   *2022*
- *Placed on the Honor List of Student Tutors for Excellence in Teaching*   *2022*
- *Graduate Research Fellowship*, National University of Singapore   *2018-2022*
- *MobiSys Best Poster Runner-Up Award*   *2019*
- *Research Forum Award* at the Deep Learning & Security Workshop, NUS   *2017*
- *Indian Academy of Sciences Fellowship*   *2016*

TEACHING EXPERIENCE

- Teaching Assistant for CS4222 Wireless Networks   *Spring 2022*
- Teaching Assistant for CS3103 Computer Networks Practice   *Fall 2021*

- Teaching Assistant for CS3235 Computer Security *Spring 2020*

- Teaching Assistant for CS5476 IoT Security *Fall 2019, Fall 2020*

PROFESSIONAL SERVICE

Student Reviewing Member

- Master of Computing Admission in the School of Computing, NUS (2022)

Program Committee Member / Reviewer

- ACM IMWUT 2023, 2024, 2025

- CHI Late Breaking Work 2025

- ACM MobiCom 2024 S3 Workshop

- ACM MobiSys 2024 Artifact Evaluation

- ACM Transactions on Internet of Things 2022

External Reviewer

- Conferences: S&P 2024, Security 2024, IPSN 2024, SenSys 2020-2023, IoTDI 2020-2022, ICDCS 2020-2022, COMSNETS 2020-2021, WiSec 2019, MobiSys 2019, 2024

- Workshops: HotMobile 2022, 2024