

Soundarya Ramesh

(Last Updated: October, 2025)

PROFESSIONAL SUMMARY

Postdoctoral researcher at the National University of Singapore specializing in sensing systems and machine learning for human well-being and safety. Experienced in designing, training, and evaluating deep learning models, curating large-scale datasets, and applying statistical and computational methods to real-world data from audio and physiological sensors. Recognized with the Google PhD Fellowship and multiple awards for research excellence and communication, including the MobiSys Rising Star, a Best Poster Runner-Up Award as well as a teaching excellence award.

EDUCATION

National University of Singapore

Ph.D. in Computer Science

Advisors – Jun Han and Chan Mun Choon

Thesis – Duality of Microphone Privacy: New Threats and Improved Defenses

Aug 2018 – Dec 2024

Current GPA : 4.92/5

National Institute of Technology Karnataka, India

Bachelor of Technology in Information Technology

Aug 2014 – May 2018

GPA : 9.01/10

WORK EXPERIENCE

Postdoctoral Researcher at the Augmented Human Lab, NUS

Jan 2025 – Present

- Conducting research on audio ML and multimodal AI to enhance human safety and well-being
- Collected the largest drone audio dataset with 23.5 hours of recordings, by creating a testbed for indoor search and rescue, which is accepted to the NeurIPS 2025 Datasets and Benchmarks track
- Developing deep learning-based noise suppression techniques for human presence detection in drone-based rescue missions
- Delivered invited talks to industry partners, leading to a collaborative research grant with a healthcare-focused company.
- Developed mood prediction models based on a large physiological dataset from wearables, which is accepted to the NeurIPS 2025 Time Series for Health Workshop

Research Intern, Augmented Language Team in Google, Mountain View

May-Aug 2022

- Conducted research on speaker diarization using a multi-microphone setup for AR Glasses
- Experimented with head rotation cues to enhance speaker re-identification accuracy
- Collaborated with cross-functional teams to innovate audio processing techniques for AR Glasses

Graduate Research Assistant, National University of Singapore

Aug 2018 – Dec 2024

- Conducted interdisciplinary research on audio signals to assess user-privacy risks
- Led three projects demonstrating the privacy implications of ambient sounds, and obtained research coverage in mainstream media including Forbes, ACM News, Mashable and Scientific American
- Led a project on detecting microphone on/off status using electromagnetic leakage signals and open-sourced the hardware and software implementations
- Published four research papers in top-tier venues (ACM CCS, Usenix Security, ACM MobiCom, ACM SenSys), with acceptance rates under 25%, and received presentation and poster awards.

FEATURED PUBLICATIONS

1. *DroneAudioset*: An Audio Dataset for Drone-based Search and Rescue. Ramesh, S.*, Gupta, C.*, Sasikumar, P., Yeo, KP., & Nanayakkara, S. **NeurIPS 2025 Datasets and Benchmarks Track**.
2. *Don't Sleep on Sleep Data*: Influence of Sleep Physiology on Stress Detection. Ramesh, S., Masuda, T., Lee, HW., Hu, Y., & Nanayakkara, S. **NeurIPS 2025 Time Series For Health Workshop**.
3. Enhancing LoRa reception with generative models: Channel-aware denoising of LoraPHY signals. Sabharwal, K., Ramesh, S., Wang, J., Divakaran, D. M., & Chan, M. C. **ACM SenSys 2024**.
4. *MagTracer*: Detecting GPU cryptojacking attacks via magnetic leakage signals. Xiao, R., Li, T., Ramesh, S., Han, J., & Han, J. **ACM MobiCom 2023**.
5. *TickTock*: Detecting Microphone Status in Laptops Leveraging Electromagnetic Leakage of Clock Signals. Ramesh, S., Hadi, G. S., Yang, S., Chan, M. C., & Han, J. **ACM CCS 2022**.
6. *Keynergy*: Physical Key Inference Attack Revisited. Ramesh, S., Xiao, R., Maiti, A., Lee, J. T., Ramprasad, H., Kumar, A., Jadliwala, M., & Han, J. **Usenix Security 2021**.
7. *SpiKey*: Audio-based Physical Key Inference. Ramesh, S., Ramprasad, H., & Han, J. **ACM HotMobile 2020**.
8. *SoundUAV*: Delivery Drone Authentication by Fingerprinting Drone's Motor Noise. Ramesh, S., Pathier, T., & Han, J. **ACM DroNet 2019**, co-located with MobiSys 2019.

HONORS AND AWARDS

- *Google PhD Fellowship* 2021-2024
- *MobiSys Rising Star Award* 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
- *MobiSys Best Poster Runner-Up Award* 2019
- *Research Forum Award* at the Deep Learning & Security Workshop, NUS 2017

OTHER EXPERIENCES

- Founded the Graduate Students Association in Computing (GSAC) and organized 20+ events for graduate students in the Computer Science department
- Teaching Assistant for Wireless Networks, Computer Networks Lab, Computer Security, IoT Security
- Student Reviewing Member for M.Comp Admission at NUS in 2022
- Reviewer for ACM TIOT 2022, ACM IMWUT 2023-2025, ACM MobiCom 2024 S3 Workshop, CHI Late Breaking Work 2025, Neurips 2025 TS4H Workshop

SKILLS

Programming: Python, C/C++, Matlab

Python Libraries: Scikit-Learn, PyTorch, Tensorflow, NumPy, SciPy, Pandas, Matplotlib

Core ML & AI: Deep Learning (CNNs, RNNs, Transformers, LLMs), Self Supervised Learning, Classical ML (SVM, Linear and Logistic Regression), Ensemble Methods (XGBoost)

Other Expertise: Large-Scale Data Collection, Statistical Analysis (ANOVA, Non-parametric tests)

Tools: Git, Anaconda, Jupyter, LaTeX, Hugging Face

Hardware: 3D-Printing and Prototyping, Development with Respeaker Microphone Array, USRP B210 Software Defined Radio, Raspberry Pi, Arduino