

DHAIRYA SHAH

EMBEDDED AND WIRELESS SYSTEMS RESEARCHER

 [Website](#) |  [LinkedIn](#) |  [Github](#) |  [Google Scholar](#) |  dhairya@u.nus.edu |  +919769016020

EDUCATION

National University of Singapore (NUS) | Singapore Aug 2024 - Present

Doctor of Philosophy (Ph.D.) in Computer Science

Advisor: Prof. Ambuj Varshney

Thesis: Tackling the Energy and Spectrum Challenges of Wireless Embedded Systems

Veermata Jijabai Technological Institute (VJTI) | Mumbai, India Aug 2019 - Jun 2023

Bachelor of Technology (B.Tech) in Electronics and Telecommunication Engineering

CPI: 9.75/10

Awards: [University Rank: 1/756](#) - Secured highest CPI across all B.Tech majors.

PUBLICATIONS

* *co-primary authors*

- Microwatt Microwave (M^2) Oscillator: Going Beyond the Delegation Architecture of Low-power Wireless Communication**
[D. Shah*](#), P. Medaranga*, C. R. Reddy, S. Sara, P. Dutta, A. Varshney MOBISYS '26
[Featured Paper: Top 10/302](#)
- HILO: Enabling Low-power, Dual-Band Communication using Tunnel Diode Oscillators**
[D. Shah*](#), C. R. Reddy*, P. Medaranga, A. Varshney RFID '26
- AudioCast: Enabling Ubiquitous Connectivity for Embedded Systems through Audio Broadcasting Low-power Tags**
[D. Shah*](#), C. R. Reddy*, N. Ang, A. Varshney IMWUT '25
[Github](#)
- TunnelSense: Low-Power, Non-Contact Sensing using Tunnel Diodes**
[D. Shah*](#), T. Lim*, C. R. Reddy*, Y. Bhadauria, M. Gulati, A. Varshney RFID '24
- Li-FiAR: Networking Augmented-Reality Devices through Visible Light**
[D. Shah*](#), M. Shah*, P. Medaranga, A. Varshney S3: MOBICOM '24
- PixelGen: Re-thinking Embedded Cameras for Mixed-Reality**
[D. Shah*](#), K. Li*, M. Gulati* et al. ImmerCom: MOBICOM '24
[Github](#)

POSTERS & DEMOS

- Going Beyond the Delegation Architecture of Low-power Wireless Communication**
[D. Shah*](#), P. Medaranga*, C. R. Reddy, S. Sara, P. Dutta, A. Varshney Poster: MOBISYS '26
[Award: Best Poster Runner-Up](#)
- Microwatt Microwave (M^2) Oscillator: Enabling 105 μ W, Stable and Standalone Transceivers**
[D. Shah*](#), P. Medaranga*, C. R. Reddy, S. Sara, P. Dutta, A. Varshney ISLPED Design Contest '26
[Award: Best Demo Honourable Mention](#)
- Ubiquitous Battery-free Sensing AirTags**
S. Sara, [D. Shah](#), P. Medaranga, C. R. Reddy, A. Varshney Demo: MOBISYS '26, N2Women
- VisibleBits: Illuminating Mixed Reality with Li-Fi Information Spotlights**
C. Xuan, [D. Shah](#), A. Varshney Demo: MOBICOM '25

5. **Enabling Low-power Ubiquitous Connectivity for Embedded Systems through Audio Broadcasting Tags**
D. Shah*, C. R. Reddy*, A. Varshney Demo: UBICOMP '25 & MOBISYS '25
6. **GateHaul: A Gateway Architecture using Backhauling Networks to Address the Connectivity Challenges of Embedded Systems**
S. Sara, M. Shah, D. Shah, C. R. Reddy, A. Varshney Demo: MOBICOM '24
7. **Simplifying the Networking of Wireless Embedded Systems using a Large Language Model**
D. Shah*, P. Medaranga*, S. V. Kandala*, A. Varshney Poster: SIGCOMM '24
8. **PixelGen: Rethinking Embedded Camera Systems for Mixed-Reality**
K. Li*, M. Gulati*, D. Shah, S. Waskito, S. Chakrabarty, A. Varshney Demo: IPSN '24
[Award: Best Demonstration Runner-Up](#)
9. **Enabling Non-contact, Low-Power Sensing using Tunnel Diodes**
Y. Bhadauria*, T. Lim*, C. R. Reddy*, M. Gulati, D. Shah, A. Varshney Poster: IPSN '24

EXPERIENCE

Nokia Bell Labs | Cambridge, UK May 2025 – Aug 2025
Research Intern Advisors: Chulhong Min, Fahim Kawsar
Built a distributed edge-cloud framework to deploy multimodal sensory LLM pipelines on embedded devices for low-latency, privacy-preserving health inference.

WEISER Group, National University of Singapore | Singapore Nov 2023 – Aug 2024
Research Assistant Advisor: Prof. Ambuj Varshney
Designed ultra-low-power (microwatt-level) RF sensing, communication, and vision systems for XR devices.

SENS Lab, EPFL | Lausanne, Switzerland Jun 2023 – Sep 2023
Summer@EPFL Research Intern Advisors: Prof. Haitham Al Hassanieh, Junfeng Guan
Developed a mmWave joint communication-and-sensing testbed with phased-array beamforming and fast electronic beam steering (20 ms/beam; full spatial scan < 1.26s).

CRITIAS Lab, École de Technologie Supérieure | Montreal, Canada May 2022 – Aug 2022
Research Intern Advisor: Prof. Jérémie Voix
Developed a multimodal synchronization platform for precise alignment of audio and biosensory streams.

Espressif Systems | Pune, India Dec 2022 – Jun 2023
Embedded Software Intern Team: ESP-Matter Development Team
Contributed to Espressif's firmware stack for Matter enabled IoT devices.

The Linux Foundation | Remote Sept 2021 - Nov 2021
Open Source Developer Organization: RISC-V
Worked on RISC-V (RV64GC) porting and regression testing of SpiderMonkey's Baseline JIT compiler.

SKILLS

Languages	C, C++, Python, MATLAB, P4, Kotlin, JavaScript
Protocols	BLE, LoRa, Wi-Fi, Matter, I2C, SPI
Platforms	ESP32, STM32, MSP430, Ambiq Apollo, Arduino, Raspberry Pi
Frameworks	GNU Radio, KiCad, LTspice, Altium, Multisim, Logisim, ROS, Gazebo, GNU Octave

TEACHING

CS4222/5422: Wireless Networking, NUS

Spring '25, '26

AWARDS & FELLOWSHIPS

- **Best Demo Honorable Mention:** ACM/IEEE ISLPED '26
- **Best Poster Runner-Up and Featured Paper:** ACM MobiSys '26
- **NUS Research Achievement Award:** Selective award for research excellence
- **Travel Grants:** ACM SIG (UbiComp '25) and NUS SoC (RFID '26, MobiCom '25, UbiComp '25)
- **Best Demo Runner-Up:** ACM/IEEE IPSN '24
- **NUS PhD Research Fellowship:** Doctoral fellowship, National University of Singapore
- **Summer@EPFL Research Fellow '23:** Selective research internship at EPFL (< 1.2% acceptance)
- **Director's Gold Medal:** University Rank 1 (highest CPI across all B.Tech cohorts at VJTI)
- **Baroda Achiever's Award:** Scholarship for academic excellence
- **Mitacs Globalink Research Fellowship '22:** Research internship at ETS Montreal, Canada
- **Linux Foundation Fellowship '21:** Open-source mentorship fellowship (RISC-V)
- **Delta International Smart & Green Automation Contest '21:** Second Prize worldwide
- **e-Yantra eYRC Robotics Challenge '21:** All India Top 20 finalist

VOLUNTEERING

ACM S3 Workshop: MobiCom 2026

Technical Program Committee Reviewer

Fall 2026

Graduate Students Society (GSS), NUS

Director of Community Affairs

Aug 2025 - Jun 2026

Creativity Secretary

Aug 2024 - Jun 2025

Society of Robotics and Automation (SRA), VJTI

Joint General Secretary and Treasurer

Jun 2020 - Jun 2022