

Geneva Ecola

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Education

- Expected 2027** **Ph.D. Electrical Engineering, Stanford University**
Thesis: Harnessing Ambient Radio Signals for Ultra-Low Power Connectivity
Advisor: Zerina Kapetanovic, Thesis Committee: Howard Zebker, Joseph Kahn
- 2023** **M.S. Electrical Engineering, Stanford University**
- 2019** **B.S. Engineering, Harvey Mudd College**

Industry Experience

- Summer 2024** **Radio Frequency Intern, Apple**
Developed new testbed to analyze the impact of chip packaging variants on radio receiver performance. Automated optical chip-fiber alignment and measured photonic structures.
- Summer 2023** **Wireless Hardware Intern, Tesla**
Evaluated localization technologies for a passive entry system including BLE and UWB. Designed and evaluated RF balun circuit matching between chip and antenna.
- 2019 – 2021** **Senior Radio Frequency Engineer, Trellisware Technologies**
Redesigned the high-frequency analog front-end of radios using simulations and tested hardware in lab. Led hardware sustainment of a software-defined radio digital board, coordinating team of 10+ engineers.
- Summer 2018** **Antenna Intern, Echodyne**
Measured electronically scanning array antenna near field at multiple scan angles and frequencies and developed MATLAB scripts to quantify antenna performance metrics.

Publications

- 2026** **First-Principles Channel Model and Capacity-Achieving Transmission Scheme in Thermal Noise Backscatter Links**
Geneva Ecola*, Jida Zhang*, Joesph Kahn and Zerina Kapetanovic
Under Review at PNAS
- 2025** **Wireless Johnson Noise Thermometry for Passive Temperature Sensing**
Geneva Ecola*, Jasmin Falconer* and Zerina Kapetanovic
IEEE Journal of Microwaves
- 2025** **SARLink: Satellite Backscatter Connectivity using Synthetic Aperture Radar**
Geneva Ecola, Bill Yen, Ana Banzer Morgado, Bodhi Priyantha, Ranveer Chandra, and Zerina Kapetanovic
ACM SenSys

*indicates co-first authorship

Posters

- 2024** **Ultra-low Energy IoT Networks Using Thermal Noise Communications**
Geneva Ecola, Jida Zhang and Zerina Kapetanovic
Qualcomm Innovation Fellowship Finals
- 2024** **Vision Assisted Beamsteering for Full Control of Wireless Power Transfer and Joint Communication Link**
Jasmin Falconer, Geneva Ecola, and Zerina Kapetanovic
Stanford Center for Image Systems Engineering Affiliates Annual Meeting
- 2025** **SARLink: Satellite Backscatter Connectivity using Synthetic Aperture Radar**
Geneva Ecola, Bill Yen, Ana Banzer Morgado, Bodhi Priyantha, Ranveer Chandra, and Zerina Kapetanovic
ENSsys Workshop: Energy Harvesting & Energy-Neutral Sensing Systems
- 2024** *Stanford Center for Image Systems Engineering Affiliates Annual Meeting*

Talks

- 2026** **Ultra-low Energy IoT Networks Using Thermal Noise Communications**
Apple Fellowship Talk
- 2025** **Doing More with Less: Harnessing Ambient Signals for Wireless Sensing and Communication**
University of Washington Department of Electrical Engineering
Apple Fellowship Talk
- 2025** **SARLink: Satellite Backscatter Connectivity using Synthetic Aperture Radar**
ACM SenSys
Apple Fellowship Talk

Honors

- 2026** **Qualcomm Innovation Fellowship Finalist**
Proposal: Ultra-low Energy IoT Networks Using Thermal Noise Communications
- 2025** **Stanford Emerging Environmental Scholar Research Award**
Proposal: Bringing Smart Sensing Systems Everywhere on Earth
- 2024** **Stanford Graduate Fellowship, Rambus Corporation Fellow**
- 2024** **Apple-Stanford Integrated Systems PhD Fellowship**
Proposal: Enabling Ultra-Low Power Smart Sensing Systems
- 2023** **Stanford EE315 Best Analog to Digital Converter Design**
- 2021** **Stanford Graduate Fellowship, Rambus Corporation Fellow**
- 2019** **Harvey Mudd College Departmental Honors in Engineering**
- 2018** **Harvey Mudd College T. Larry Norin Memorial Scholarship**
- 2018** **Harvey Mudd College Best Engineering Clinic Presentation**
- 2015** **Harvey Mudd Merit Award**

Teaching Experience

- 2026** **Course Development, Internet of Things, Stanford University**
Developed labs and final project for Internet of Things course to teach students about building devices and enabling internet connectivity via different wireless protocols.
- 2025** **Course Assistant, Circuits I, Stanford University**
Ran lab sections and office hours for 30+ students in introductory circuits course. Gave midterm and final review lectures.
- 2023** **Course Development and Assistant, 3D+ Imaging Sensors, Stanford University**
Led lab sessions and office hours for 30+ students on ultrasonic sensors, time-of-flight cameras, and mmWave radar. Designed final project to design a through-wall imaging system using mmWave radar.
- 2017 – 2018** **Teaching Assistant, Systems Engineering, Harvey Mudd College**
Taught concepts needed to complete lab experiments and provided debugging help.

Advising

- 2025 – Present** Rudraksh Mohapatra, Undergraduate Researcher
2024 Sylvia Chen, Undergraduate Researcher

Outreach

- 2024 – 2025** **Stanford Women in Electrical Engineering**
Vice President
Organized professional development events and community building, including a 50+ person mentorship program.
- 2023** *Outreach Chair*
Hosted outreach events including teaching high schoolers at Stanford Splash.

Service

- 2025, 2026** **Reviewer**
IEEE Journal of Microwaves
- 2025** *ACM SenSys Poster PC Member*
- 2026–Present** **Branch Chair and Founder, Stanford IEEE Microwave Theory & Technology**
Host workshops and talks on microwave engineering topics to enable networking opportunities and create a community of student interested in wireless design.
- 2024–2025** **Student Life and Culture Committee**
Stanford University Department of Electrical Engineering