Le (Leonard) Zhang

Pronouns: They/them | Email: lez014@ucsd.edu | Research website: leonardz.me | Github: lezhangleonard

Department of Computer Science and Engineering, University of California, San Diego, La Jolla, CA 92093-0404

Education

M.S. in Computer Science, University of California, San Diego — Expected June 2025

Advisor: Prof. Tajana Šimunić Rosing

B.A. in Computer Science, University of North Carolina at Chapel Hill — December 2022

Major in Computer Science and Minor in Mathematics. GPA: 3.78/4.0.

Advisor: Prof. Shahriar Nirjon

Research Interests

- Resource-efficient machine learning and embedded intelligences.
- Energy-harvesting, batteryless systems and intermittent computing.
- Intelligent acoustic and speech applications
- Sustainable and wearable human-centered designs and emerging technologies.

Awards & Grants

Dean's List: University of North Carolina at Chapel Hill — 2019—2022

Honorable Mentioned Award: ICPC Mid-Atlantic Regional — 2019

Publications

1. **Le Zhang**, Onat Gungor, Flavio Ponzina, and Tajana Rosing. "E-QUARTIC: Energy Efficient Edge Ensemble of Convolutional Neural Networks for Resource-Optimized Learning." *The Asia and South Pacific Design Automation Conference (ASP-DAC),* 2025

2. Yubo Luo, **Le Zhang**, Zhenyu Wang, and Shahriar Nirjon. "Antler: Exploiting Task Affinity for Efficient Multitask Learning on Low-Resource Systems." *The International Conference on Embedded Wireless Systems and Networks (EWSN),* 2024

3. Run Wang, Shirley Bian, Xiaofan Yu, Quanling Zhao, **Le Zhang**, and Tajana Rosing. "Poster: Resource-Efficient Environmental Sound Classification Using Hyperdimensional Computing." *The ACM Conference on Embedded Networked Sensor Systems (SenSys),* 2024

4. **Le Zhang**, Yubo Luo, and Shahriar Nirjon. "Demo Abstract: Capuchin: A Neural Network Model Generator for 16-bit Microcontrollers." *The ACM/IEEE Conference on Information Processing in Sensor Networks (IPSN),* 2022

Parchments

1. **Le Zhang**, Quanling Zhao, Run Wang, Shirley Bian, Onat Gungor, Flavio Ponzina, and Tajana Rosing. Paper is under double-blind peer review process. Submit to *SenSys 2025*.

Research Experience

Student Researcher, System Energy Efficiency Lab (SeeLab), UC San Diego — 2024

Resource-Constrained Collaborative Environmental Sound Recognition over LPWANs.
Advisor: Prof. Tajana Rosing

- Proposed a novel cloud-assisted offloading for resource-efficient learning on low-power wide-area networks (LPWANs) like LoRa. Designed for adaptive collaboration for resource-constrained energy-harvesting systems and low-bit rate, unreliable wireless channels.

- Achieved 2.5-12.5% improvement in accuracy, 80x in energy savings, and 220x in latency reduction compared to the state-of-the-art methods.

Student Researcher, the Systems Energy Efficiency Lab (SeeLab), UC San Diego 2023—2024

Energy Efficient Ensemble Learning on Energy-Harvesting Systems.
Advisor: Prof. Tajana Rosing

- Developed an energy-adaptive ensemble learning framework for efficient inference and training on STM32 microcontroller. Improved the reliability of energy-harvesting machine learning system in low-energy conditions up to 40%.
- Paper accepted by *ASP-DAC 2025*.

Undergraduate Research Assistant, Embedded Intelligence Lab, UNC-Chapel Hill 2021—2022

Exploiting Task Affinity for Efficient Multitask Learning on Low-Resource Systems.
Advisor: Prof. Shahriar Nirjon

- Developed and evaluated an efficient multitask learning framework and memory management algorithm to optimize the orders of multitask executions on low-resource embedded systems.
- Paper accepted by *EWSN 2024*.

Undergraduate Research Assistant, Embedded Intelligence Lab, UNC-Chapel Hill 2021—2022

Efficient Neural Network Implementations on 16-bit Microcontrollers.
Advisor: Prof. Shahriar Nirjon

- Developed a neural network model generator for 16-bit TI MSP430 series microcontrollers. Improved workflow from minutes to several seconds.
- Reduced more than 50% inference time and energy consumption using hardware accelerator compared to the state-of-the-arts.
- Demo published in *IPSN 2022*.

Mentored Research, UNC-Chapel Hill 2021

Remote Collaborative Physics Simulation for High School Physics Education.
Advisor: Prof. Prasun Dewan

- Developed a remote user interface coupling platform for physics simulations in high school physics education using RPCs and IPCs to synchronize physical animations remotely.

Teaching & Mentoring

Research Mentoring, Energy-harvesting Machine Learning Testbed Fall 2024

Mentee: Run Wang, undergraduate student in ECE at UCSD. Shirley Bian, undergraduate student in CS at UCSD.

Research Mentoring, Hyperdimensional Computing on Embedded Systems Spring 2024

Mentee: Run Wang, undergraduate student in ECE at UCSD. Publication in *SenSys '24* poster.

Teaching Assistant, COMP 301: Foundations of Programming, UNC-Chapel Hill Summer 2021

Assisted in course instruction under Prof. Prasun Dewan, aiding students in introductory-level Java programming.