MS or PhD Position in Embedded Algorithms for Underwater Acoustics

Start Date: Fall 2026

Location: Department of Ocean Resources and Engineering, University of Hawai‘i at Mānoa

Compensation: Annual stipend plus tuition waiver pending project funding (TBD September 2025). Selected applicant will also be expected to apply for internal and external fellowships.

Project Overview: We are seeking a motivated MS or PhD student to join an interdisciplinary project focused on developing **embedded algorithms** for real-time **acoustic detection and localization** of low- and mid-frequency sounds including reef fish vocalizations. Next-generation undersea surveillance for both naval and marine conservation applications demands embedded, low-latency signal processing to detect and localize sounds in increasingly acoustically, cluttered environments. This project aims to enable scalable, low-power and non-invasive monitoring of acoustic transients. The work is rooted in detection and parameter estimation theory, removing the need for extensive training datasets and high computational costs required by machine learning approaches.

The student will:

- Lead the development of computationally efficient signal processing algorithms.
- Validate algorithm performance on a multi-channel passive acoustic recorder designed around an off-the-shelf single-board computer.
- Collaborate with an interdisciplinary team of computational scientists and fish ecologists.
- Participate in bi-monthly public outreach at Hanauma Bay.
- Lead at least one peer-reviewed publication and present findings at national or international conferences.

Note, for this project, we will consider supporting a student through graduate programs based in the Department of Ocean Resources and Engineering or Department of Oceanography.

The ideal candidate’s background will include:

- Bachelor’s degree in electrical engineering, ocean engineering, computer science, data science, and/or related discipline
- Background in digital signal processing and acoustics
- Excellent coding skills in Python, C and/or Rust
- Excellent written and interpersonal communication skills
- Genuine interest in marine ecology/conservation/sustainability
- Interest in science communication or public outreach
- Nice to have: Experience with hydrophone arrays or underwater acoustics
- Nice to have: Experience working with embedded hardware (e.g., Raspberry Pi and Arduino)
- Nice to have: Knowledge of detection and parameter estimation theory

To Apply: Please complete the interest form on the Marine Innovation Lab for Leading-edge Oceanography (MILLO) website: https://pagniello-lab.github.io/join-us.html by **September 1, 2025, at 5:00 PM HST.** Email inquiries will not be returned.