Tim Sananikone

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Education

University of California, Irvine, BS in Computer Science
GPA: 3.74
Relevant Coursework: Project in Computer Vision, Neural Networks and Deep Learning, Machine Learning and Data-Mining, Artificial Intelligence, Data Structures and Algorithms, Embedded Software, Internet of Things (IoT) Software and Systems

Skills

Programming Languages: Python, C++, C, Assembly, MATLAB, Java, HTML/CSS
Computer Vision & Machine Learning: PyTorch, OpenCV, Segment Anything Model (SAM), YOLOv8, Neural Radiance Fields (NeRF), ML-based Segmentation, Data Augmentation
Embedded Systems: ESP32 Micro-controller Programming (C++), Hardware-in-the-Loop (HITL) Testing, Parallel Programming, Systems Design

Experience

Machine Learning Intern, Monterey Bay Aquarium Research Institute (MBARI) – Moss Landing, CA
June 2025 – August 2025

- Developed deep learning pipeline integrating SAM and SAHI to generate kelp coverage calculations through segmentations from 42 megapixel UAV images, overcoming challenges of glint, lighting variation, and irregular structures [GitHub].
- Tested YOLOv8 as an initially, then pivoted to SAM after demonstrating better robustness for the problem.
- Scaled the pipeline to process 26,000+ aerial images across six visually distinct coastal sites.
- Developed a vegetation index-based annotation workflow to create a standardized ground truth dataset, enabling reproducible model evaluation and future research benchmarking.

Undergraduate Researcher, Molloi Lab – Irvine, CA
April 2024 – June 2025

- Developed a 3D U-Net for airway segmentation of lungs less than 2mm, addressing limited data with custom pre-processing workflows and a patch-based training pipeline [GitHub].
- Implemented data augmentation (flips, deformations) to mitigate data scarcity and improve model generalization, achieving an accuracy score of 94% under dice score with only 25 training volumes.
- Built a digital phantom generation pipeline producing 50+ synthetic CT volumes, allowing more robust testing of multi-material decomposition algorithms, increasing iodine map clarity by 20%, and contributing to an abstract accepted for the 2025 AAPM Annual Meeting.
- Created a RAW-to-DICOM conversion tool that standardized lab workflows and expanded compatibility.
- Updated legacy MATLAB code to analyze and quantify airway vessels in CT scans.

Projects

Light-Sensing Plant Robot [GitHub]

- Built an autonomous light-seeking robot using an ESP32 microcontroller programmed in C++.
- Designed a light-seeking robot and validated navigation algorithm using Hardware-in-the-Loop (HITL) testing by replaying real sensor data through a simulation to verify correct motor responses.

NeRF Model for 3D Reconstruction [GitHub]

- Implemented a Neural Radiance Fields (NeRF) model from scratch with hierarchical sampling and a dual-network architecture.
- Achieved a mean squared error of 0.0018, producing high-fidelity volumetric reconstructions from limited images input.