

Alexis Obu

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EDUCATION

Tufts University, School of Engineering: B.S. Electrical Engineering and Computer Science

Expected Graduation: Spring 2026

GPA: 3.1 / 4.0

RELEVANT COURSEWORK

Electrical Engineering: Embedded Systems, Circuits & Electronics, Digital Logic, EM Fields & Waves, Probabilistic Systems Analysis

Computer Science: Data Structures, Algorithms, Probabilistic Robotics, Machine Learning, Machine Structure and Programming, Web Programming

Mathematics: Multivariable Calculus, Linear Algebra, Real Analysis, Differential Equations, Probability, Mathematics of Data Analysis

SKILLS

Languages: C/C++, Python, Javascript, HTML & CSS, MATLAB, VHDL

Libraries & APIs: Numpy, Pandas, Scikit, OpenCV, OpenGL

Frameworks, Tools & Software: FPGA, Git, ROS-2, Ansys HFSS

KEY PROJECTS

FPGA Arcade Video Game (DVD Battle)

Nov 2024 - Dec 2024

- Developed a two-player arcade-style video game inspired by Pong and Breakout on an FPGA.
- Designed and implemented game logic, collision detection, and scoring entirely in VHDL.
- Utilized various FPGA peripherals (e.g., VGA output, switches, and buttons) to provide responsive user interaction.
- Collaborated in a small group, coordinating hardware development, debugging, and feature integration.

SwarmSense: Gesture Controlled Crazyflie Swarm

Mar 2024 - May 2024

- Lead team developing a gesture-controlled drone swarm using Crazyflie drones.
- Integrated hardware modules (Flow Deck V2, Crazyradio PA) to enhance drone stability and swarm coordination.
- Architected pipeline to integrate gesture recognition, drone command processing, and swarm coordination, ensuring proper communication between components and real-time responsiveness.
- Addressed technical challenges, including firmware compatibility and communication latency.

Image-Based Particle Filter for Simulated Drone Localization

Jan 2024 - Feb 2024

- Developed a simulation environment in Python for a drone to localize itself using an image-based particle filter against a known aerial map.
- Implemented a particle filter algorithm to estimate the drone's position based on simulated RGB image readings and reference images, with the ability to handle noise in measurements.
- Created a user interface to visualize the drone's true position, movement, and particle distribution over time, aiding in the analysis of the filter's performance.
- Conducted experiments to evaluate and optimize the effectiveness of the particle filter under various conditions.

Real-Time Fluid Simulation

Jun 2023 - Jul 2023

- Implemented Jos Stam's algorithm for real-time fluid simulation using C++ and OpenGL, resulting in an interactive simulation capable of rendering 50,000 cells in real time.
- Utilized numerical methods to solve systems of equations describing fluids.
- Employed profiling to optimize for real-time performance