Alexis Obu

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EDUCATION

Tufts University, School of Engineering: B.S. in Mathematics and Computer Science *(Dual Major)*
Expected Graduation: May 2026
Relevant Coursework:
▪ **Computer Science:** Data Structures, Algorithms, Web Programming, Probabilistic Robotics, Intro Machine Learning
▪ **Mathematics:** Real Analysis, Multivariable Calculus, Differential Equations, Linear Algebra

TECHNICAL SKILLS

Languages: C++, Python
Libraries & APIs: NumPy, Pandas, Scikit-learn, Matplotlib, Vulkan, Dear ImGui,
Tools: Git, Premake
Software Knowledge: Unreal Engine

KEY PROJECTS

Image-Based Particle Filter for Simulated Drone Localization *(February 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.
▪ Used k-means clustering to analyze different hypotheses about a simulation robot's position
▪ 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 the effectiveness of the particle filter under various conditions, such as different observation image sizes and levels of movement noise.

Real-Time Fluid Simulation *(July 2023)*:
▪ Implemented Jos Stam's algorithm for real-time fluid simulation using C++ and OpenGL, resulting in an interactive simulation capable of rendering up to 50,000 cells.
▪ Utilized numerical methods to solve systems of equations describing fluids.
▪ Used expertise in computer graphics, shaders, and rendering techniques to improve framerates.
▪ Employed profiling to optimize for real-time performance

3D Rendering Engine *(Ongoing)*:
▪ Developed a 3D graphics rendering engine using C++ and Vulkan, gaining a deep understanding of the graphics pipeline.
▪ Implemented GUI using Dear ImGui to track metrics such as framerate and frame time
▪ Designed a scalable and modular development environment, implementing build management and configuration with Premake.
▪ Utilized Git/GitHub for version control and project tracking.

EXPERIENCE

Project Management Intern, HS2 Project, Department of Transport *(July 2019 - August 2019)*:
▪ Prepared a comprehensive summary report, justifying and proposing mitigation measures for project delays.
▪ Developed strong communication and teamwork skills in a professional environment.

INTERESTS

▪ Passionate about graphics programming, artificial intelligence, and exploring cutting-edge technologies in computer science. ▪ Fitness, Coffee, Intramural Dodgeball **CHAMPION**