Ege Ozgul egeozgul@gmail.com egeozgul.com Linkedin:egeozgul

WORK EXPERIENCE

Rivian **Palo Alto, CA**

Embedded Software Engineer (Intern) *June 2025 - August 2025*

- Owned the end-to-end design, implementation, testing, and deployment of an automated diagnostics and fault-detection system built from scratch for embedded vehicle software, integrating CI/CD, release validation, and post-failure analysis.
- Architected an automated root-cause analysis pipeline correlating sensor data with embedded and connectivity logs, cutting release validation time from days to minutes and eliminating manual triage.
- Designed the architecture of a scalable analysis framework supporting parallel replay and analysis of sensor data across embedded programs, with extensibility to HIL testing; Drove cross-team adoption and transitioned platform ownership to a partner team.

Samsung Research America - Think Tank Team **Mountain View, CA**

Embedded Systems Engineer - Full Time *August 2023 - December 2023*

- Prototyped an AI assistant earbud, integrating Qualcomm-provided firmware and prototyping electronics for voice-based interaction.
- Designed a custom PCB around a Qualcomm processor and implemented embedded firmware in C.
- Developed a Voice Activation Detection pipeline and optimized for real-time embedded execution in C under latency constraints.
- Integrated an LLM backend with a bidirectional voice pipeline, configuring server-side speech-to-text and text-to-speech services to enable low-latency conversational interaction on a wearable device.

Amazon Robotics **North Reading, MA**

Robotics Software Development Engineer (Simulation team) - Internship *May 2022 - August 2022*

- Developed a digital twin of a warehouse station in NVIDIA Isaac Sim, modeling autonomous robots with accurate physics and photorealism.
- Integrated a real-time VR human-in-the-loop interface with C++ and Python, enabling remote training for complex machinery interactions.

Tufts University **Medford, MA**

Research Engineer - Full-time *December 2023 - May 2024*

- Integrated LiDAR into research platforms, and developed STM32 firmware for real-time sensor interfacing and post-deployment debugging.

Research Engineer - Part Time *2021 - December 2023*

- Built a fully automated sensor fabrication device for Tufts NanoLab, enabling on-demand production of high-quality tension sensors.
- Implemented stepper-motor controller with electromechanical components and real-time PID controller in embedded C.
- Accelerated prototyping cycles from weeks to hours and ensured reproducible sensor characteristics critical for research.
- **Publication (2024):** Automated Fabrication of Smart Strain Sensing Threads (Publication Link) (Media Link)

PROJECTS

Multi-Agent Robotics Autonomy System (Simulation & Sim-to-Real) – Northeastern University **Oct 2025 – Present**

- Leading the design of a MuJoCo-based robot simulation stack to evaluate learning-based control policies, surface sim-to-real failure modes (localization drift, contact dynamics), and validate deployment on physical robots.
- Building a simulation environment and autonomy stack for Stretch 2 (with ROS2), implementing LiDAR-based SLAM, AMCL localization and autonomous docking with recovery behaviors; collaborating with RL researchers on policy integration (targeting IROS).

Real-Time Procedural Environment Engine (C / OpenGL) (Project Link) **2022**

- Designed an OpenGL-based real-time procedural environment engine in C, implementing real-time mesh subdivision, camera-driven LOD, and memory recycling to support infinitely scalable environments with constant memory usage.

From-Scratch Software 3D Rendering and Physics Engine (C++) (Project Link) **2021**

- Built a from-scratch C++ software 3D renderer and physics engine, implementing triangle rasterization, depth buffering, face culling, OBJ loading, real-time FPS control, and buoyancy-based rigid-body dynamics.

Servo Motor Feedback Controller (Project Link) **2024**

- End-to-end development of a real-time embedded motor control system, converting feedback DC motors into precision servos.
- Implemented high-frequency PID control and trapezoidal trajectory planning in C on STM32, designing custom PCB hardware (H-bridge, UART/I2C) and validating closed-loop behavior under sensor noise, load variation, and fault conditions.
- Delivered a drop-in control module enabling rapid experimentation and integration eliminating months of duplicated development effort.

EDUCATION

Northeastern University **Boston, MA**

Master of Science in Robotics *2024- May 2026*

- Reinforcement Learning, Feedback Control Systems, Geometric Deep Learning, Legged Robotics, Autonomous Field Robotics

Tufts University **Medford, MA**

Bachelor of Science in Electrical and Computer Engineering *2019-2023*

TECHNICAL SKILLS

- **Hardware & Embedded:** C/C++, Python, Assembly, STM32, ESP32, Atmel, Xilinx FPGA, VHDL, System-Verilog, Altium, KiCad, Motor drivers (brushed/brushless), SMD soldering, I2C, SPI, UART, CAN, RTOS, PID, trapezoidal control,ROS2
- **Robotics & Perception:** Camera intrinsics & calibration fundamentals (MS coursework), 2D/3D SLAM, Kalman filtering, GTSAM