Roderick L. Renwick

ML / Computer Vision Engineer

Portfolio: roderickrenwick.com | GitHub: RLR-GitHub | USA

Summary

Machine Learning and Computer Vision engineer with experience building real-time perception systems, optimizing ML under performance constraints, and model deployments in autonomy for defense-adjacent environments. Strong in Python and C++, with hands-on experience spanning model development, systems integration, and edge/embedded inference.

Technical Skills

- ML/CV: CNNs, detection, segmentation, GANs
- Frameworks: PyTorch, TensorFlow, OpenCV
- Programming: Python, C++, Linux
- Systems: IRT pipelines, embedded inference, performance optimization
- Hardware Exposure: FPGA (VHDL), compute-constrained ML
- Domains: Autonomy, perception, defense-grade AI, on-device ML

Experience

Machine Learning Research Intern — **Raytheon Technologies**

- Developed ML and CV algorithms for aerospace and defense applications
- Built and evaluated perception pipelines under real-world operational constraints
- Collaborated with senior researchers on validation, robustness analysis, and deployment readiness
- Contributed to research efforts where reliability and correctness were critical system requirements

Autonomous Systems Research — **University Project**

- Designed real-time perception stack for an autonomous shuttle platform
- Implemented object detection and tracking modules supporting downstream decision-making
- Addressed noisy sensor data, dynamic environments, and real-time execution constraints

Projects

Embedded Computer Vision System

- Designed and deployed CNN-based detection and segmentation pipeline on edge hardware
- Optimized inference latency and memory footprint for real-time performance
- Integrated model output into an end-to-end system rather than a standalone demo

GAN-Based Image Generation System

- Built and trained a GAN for image synthesis
- Evaluated output quality, stability, and failure modes
- Gained experience debugging training dynamics in deep generative models

FPGA Neural Network Accelerator (VHDL)

- Implemented a multi-layer perceptron in hardware
- Compared hardware execution characteristics against software baselines
- Developed hardware-aware intuition for ML system design

Education

M.S. Electrical & Computer Engineering — Purdue University, December 2025

B.S. Computer Engineering — University of Michigan–Dearborn, 2020