Aidan Gray

(415) 717-9467 | aidantgray@gmail.com | linkedin.com/in/aidantgray/ | github.com/Aitgray | aidangray.dev
San Rafael , California

Professional Summary

Recent M.S. graduate in Computer Science specializing in systems engineering, cloud infrastructure, and applied machine learning. Experienced in building end-to-end data pipelines, distributed systems, and real-time ML-driven applications. Proven ability to design, deploy, and evaluate production-grade systems across simulation, cloud, and networking environments.

Key Skills

Systems & Infrastructure: Distributed Systems, Containerization (Docker, Docker Compose), Cloud VM Deployment, Storage Systems, RPC, Chord DHTs, MapReduce, CI/CD Pipelines
Cloud & DevOps: Azure Blob Storage, Azure Cognitive Services, Google Cloud, Cloudflare, REST APIs, Logging and Monitoring Pipelines
Data, ML & Simulation: Computer Vision, Reinforcement Learning (CARLA), Diffusion Models, Synthetic Data Generation, Model Evaluation, PCA, SVM, Statistical Validation
Programming & Frameworks: Python, C++, Go, PyTorch, scikit-learn, CUDA, vcpkg
Networking & Security: ICS / SCADA Protocols (Modbus), Packet Parsing, Traffic Generation, Wireshark, Network Validation Pipelines

Professional Experience

Teaching Assistant – UC Santa Cruz, Santa Cruz, CA
March 2025 – June 2025

- Supported instruction for an undergraduate Computer Science course, specializing in Python programming.
- Developed and evaluated quizzes and exams, providing feedback and performing reviews to improve student performance and understanding.
- Restructured assessment weights and Canvas gradebook settings to improve grading accuracy, fairness, and transparency.
- Led lab sections, instructing 60 students in problem solving, debugging, and algorithms.

Customer Service Specialist – Safe Harbor Marinas, San Rafael, CA
2019 – 2022

- Created an internal job ticketing system to improve response times and prioritization of client repair requests, optimizing workload management and repair throughput.
- Completed high-volume, labor-intensive structural repairs over extended shifts, demonstrating reliability, endurance, and attention to detail.

Research & Technical Projects

KVALD - Master's Research https://github.com/Aitgray/KVALD

- Designed and implemented an end-to-end vision system to mitigate windshield glare in driver-assist and automotive perception pipelines using spatially localized dimming.
- Built a real-time 60 FPS Python pipeline integrating CNN-based glare detection with Kalman filtering to stabilize predictions across frames and reduce flicker under dynamic lighting conditions.
- Developed a synthetic training data generator utilizing BDD100K and Flare7k++ datasets.
- Structured the system as modular components to support future model replacement, dataset expansion, and real-time deployment.

Cloud Storage Systems Benchmarking

- Built an automated benchmarking framework using Terraform, Docker, and YCSB to provision and evaluate PostgreSQL and ScyllaDB on Google Cloud virtual machines.
- Executed insert, load, stress, soak, and spike workloads on datasets up to 10 million records, collecting throughput, tail latency, and system-level CPU, memory, disk, and network metrics.
- Demonstrated that ScyllaDB sustained over 15,000 operations per second on soak workloads while PostgreSQL saturated near 2,650 ops/sec due to driver-level concurrency limits.
- Validated vertical and horizontal scaling behavior across 2 to 8 vCPU machines and multi-node clusters, identifying cost-performance tradeoffs and cache-driven performance gains in distributed NoSQL systems.

Synthetic SCADA Network Traffic Generation https://github.com/char26/scada-generator

- Developed a diffusion-based model to generate realistic Modbus industrial control system packets for security and intrusion-detection research.
- Built an end-to-end pipeline to synthesize, serialize, and validate protocol-correct traffic.
- Designed a statistical validation framework using PCA and SVM classifiers to measure how distinguishable synthetic packets were from real traffic.

BardBot – Discord Automation Project https://github.com/Aitgray/BardBot

- Developed a Discord bot to transcribe audio from 3-4 hour, multi speaker DnD sessions and enable automatic summary generation.
- Built a real-time audio pipeline that captures voice data from Discord, performs diarisation and time based chunking, and transcribes speech using OpenAI's Whisper architecture.
- Embedded structured conversation segments into a vector database and applied retrieval augmented generation to provide relevant context to a locally running Llama 3.1 8B model.
- Containerized the system to improve reliability, portability, and ease of deployment.

Education

M.S. Computer Science – UC Santa Cruz, December 2025
B.S. Computer Science – UC Santa Cruz, June 2024
Relevant coursework: Distributed Systems, Computer Networks, Advanced Computer Networks (with Lab), Network Security, Computer Systems/Assembly Language, Computer Architecture, Principles of Computer System Design, Advanced Cloud Computing, Machine Learning, Artificial Intelligence