Diego Alderete Sanchez

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EDUCATION

Yale University, New Haven, CT August 2021 – May 2025
BS in Computer Science | GPA: 3.51
Relevant Coursework:
Core CS: Algorithms, Data Structures, Systems Programming, Distributed Systems, Full Stack Web Programming
Advanced Topics: Deep Learning on Graph-Structured Data, Natural Language Processing, Quantum Computing, Embedded Robotic Systems, Sound Synthesis
Mathematics: Linear Algebra, Discrete Math, Real Analysis, Multivariable Calculus

WORK EXPERIENCE

The Aerospace Center (cSETR), *Research Assistant*, El Paso, TX May 2022 – August 2024
- Developed and executed onboard experiments on a CubeSat; collaborated with graduate engineering team.
- Evaluated GPU/TPU performance limits under vacuum and ambient environments for AI workloads; developed software in Python & C++ for automated benchmarking of embedded systems.
- Designed hardware communication protocol between satellite microcontroller and onboard System-on-a-Chip to trigger experiments using GPIO pins.
- Designed and implemented an embedded file storage system for a TI MCU enabling persistent data logging and retrieval for autonomous experiments.

Yale Open Music Initiative, *Research Assistant*, New Haven, CT May 2023 – August 2023
- Optimized inventory system for 80+ synthesizers and embedded music devices improving lab organization and accessibility; integrated C++ sound libraries and embedded systems for advanced sound synthesis research.
- Developed hands-on expertise in soldering, circuit design, and embedded systems; gained proficiency in advanced sound synthesis software and audio libraries, enabling the implementation and testing of synthesis algorithms.

PROJECTS

Real-Time Performance Control for Mobile Nodes, *Capstone Project* January 2025 – May 2025
- Developed a real-time, beat-synchronized audio diffusion system for musical performances; built a modular desktop app using Rust and React for performers to assign RNBO patches and manage audience layout.
- Established robust server-client communication via WebSockets, with architecture including provisions for acoustic beacon timing for sub-sample alignment, clock drift correction, and heartbeat-based synchronization.

Bitcoin Fraud Detection with GAT September 2024 – December 2024
- Developed a Graph Attention Network (GAT) model to classify over 200,000 Bitcoin transactions from the Elliptic dataset, addressing severe class imbalance where only 2% of transactions were illicit.
- Achieved 68% F1 score and 83% precision using single-head GATs, significantly outperforming multi-head models and self-stabilizing variants
- Published results and experiment repository, contributing to advancements in cryptocurrency fraud detection.

Yale Shuttle Navigation App February 2024 – April 2024
- Led team of four developers to design and deploy enhanced Yale Shuttle application using Flask for backend and Node.js for real-time data services, completing project within rigorous 3-month development cycle.
- Leveraged full-stack development expertise to integrate complex path-finding algorithms and optimize relational database schemas, enhancing route accuracy and application performance.

SKILLS AND INTERESTS

- *Programming Languages:* Proficient in Python and C. Experienced in Golang, C++, C#, SQL, Javascript, Rust, Lisp.
- *Software Development & AI/ML:* Flask, Node.js, React, TensorFlow, PyTorch, Unity, ROS
- *DevOps & Systems:* Linux, Git, Docker, Kubernetes, AWS
- *Foreign Languages:* Spanish – Working Proficiency, Mandarin Chinese – Limited Working Proficiency
- *Interests:* Creative writing, guitar, a cappella, biking, chess, music production