




MANOLO ALVAREZ

 manolo-alvarez.github.io

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EDUCATION

Stanford University	M.S. in Electrical Engineering Focus in Deep Learning Overall GPA: 3.76/4.0	2022 - Present
University of Texas at Austin	B.S. in Electrical & Computer Engineering Minor in Business Overall GPA: 3.73/4.0	2017 - 2021

SKILLS

Advanced: Python | Pytorch | Git | Altium | Allegro | Robotics | RL | NLP | CV | PCBA Design | Power Electronics

Experienced: TensorFlow | AWS | LTPowerCAD | LTSpice | CaptureCIS | C | JavaScript | CSS | HTML | Linux.

Languages: English (Fluent) | Spanish (Fluent)

PROFESSIONAL EXPERIENCE

Electrical Design Engineer – *Aptronik; Austin, TX* April 2024 - Present

- Driving full Electrical bring up of our second-generation humanoid.
- Designed our power and communication splitter boards with a **GaN** variable power supply, **EtherCAT** switches, **RS485** transceiver, **eFuses**, and other circuits that are used across our second-generation humanoid.
- Responsible for my hardware from design through manufacturing, validation, and build.
- Owned the architecture, build, and planning of the testbed used to validate all the electronics in our system.

System Architect – *DELL Technologies; Austin, TX* July 2021 – March 2024

- Led a broad set of activities necessary to take a design from concept to production including architecture definition, analysis, schematic design, sourcing, simulation, work with **ECAD** for physical board layout/route, validation, debug, and test issue prioritization.
- Worked with cross functional teams and suppliers to ensure the design meets set requirements for schedule, feature set, functionality, cost, continuity of supply, quality, reliability, regulatory and industry standards compliance.

System Architect Intern – *DELL Technologies; Austin, TX* May 2020 – July 2020

- Managed early confidential Intel CPU and Nvidia GPU collateral to floor plan performance upgrade for 2022 XPS PC.
- Applied **highspeed** routing and **PCB** stack-up concepts to combat insertion loss, cross talk, and reduce predecessor's 14-layer motherboard to 12 layers saving about \$4,020,500USD over units sold.

Cabin & Network Systems Engineering Intern – *The Boeing Company; Seattle, WA* May 2019 – August 2019

- Analyzed power irregularities during test flights and presented a root cause report with data to support changes to the 787 In-Flight Entertainment (IFE) requirements saving about \$100,000USD per plane.
- Generated a power usage forecast of consumer electronics compatible with newest IFE systems to generate a power budget that ensures system functionality 30+ years after delivery.
- Collaborated on numerous projects with production line mechanics and engineers to improve safety and production efficiency saving over 120 work hours.

PROJECTS

Minimal Proprioception for RL January 2025 – March 2025

- Analyzed input sensitivities of trained (PPO) policies to identify the minimal proprioceptive pipeline needed for stable locomotion of a toy humanoid.

- Explored alternative learning architectures inspired by Versatile Motion Priors (VMP) and Temporal Difference Model-Predictive Control (TDMPC).

Multimodal MoE for InfographicsVQA

January 2024 – March 2024

- Developed a specialized Large Vision Language Model (**LVLM**) for engineering tasks using a Mixture of Experts (**MoE**) framework, significantly improving performance on technical visual question-answering benchmarks.

Trip Weaver

November 2023 – December 2023

- Tuned a Llama-2 7b parameter model to formulate comprehensive travel itineraries within the bounds of a PC.
- Employed Quantized Low-Rank Adapters (**QLoRA**), maximum-likelihood training on expert itineraries (**SFT**), and implicit reward models through Direct Preference Optimization (**DPO**).

When2Pivot

April 2023 – June 2023

- In this project, my colleague and I implemented and attempted to improve on the performance of state-of-the-art algorithms in autonomous **RL** benchmarks by augmenting the action space with a pivot action.

Silent Fan Boost

September 2022 – December 2022

- Built a **CNN** that attempted to learn system fan and ambient noise combinations audible to PC users.
- Sourced the hardware and developed the software to streamline the data collection and tuning process.

Decentralized Voting Application

August 2020 – May 2021

- Developed, as a team, a functioning decentralized voting application on react native that homomorphically and locally encrypted votes, stored them on the interplanetary file system, and placed the hash on the **Ethereum** network.
- Formed the idea, gathered the team, found us an advisor, led communication and **research** efforts, and integrated our solution with **IPFS** and the Ethereum **blockchain**.

Safe Box

August 2020 – December 2020

- Worked in a team to develop a smart lock box that was accessed with the pass of a blow to a **wireless** breathalyzer.
- Formulated schematics and placed, routed, and soldered the entire **PCB**.
- Responsible for the wireless integration of the **MQ3** sensor and the servo motor used to lock/unlock the box.

ML Predictive Failures with ConocoPhillips

August 2020 – December 2020

- Led development of **ML** workflows to find leading predictors for rod pump failure/downtime and optimal design.
- Compiled, wrote, and presented results to peers and industry stakeholders on a newly built and interactive dashboard.

PoliTEA Web App

January 2020 – April 2020

- Built a web app to provide information on U.S. politicians, bills, and voter resources in NodeJS.
- Implemented a frontend using **HTML**, **CSS**, Bootstrap, JQuery, and a RestAPI backend using Express and **Mongo**.

VOLUNTEERING & ACTIVITIES

Intern, Recruiting, and Recent Graduate Leader & Mentor – Dell Technologies

Aug 2022 – Mar 2024

- Intern cell group leader and mentor - Led discussions, facilitated connections, and helped them with their projects.
- Engineering recruiting co-lead for the Latino Resource Group - Hosted in-person recruiting events, established relationships with SHPE chapters across TX, and drove conversations with HR strategists. Recruited and delivered speeches at the Universities of Texas, Houston, and the GMIS conference in Pasadena, CA.
- Lead of Engineering for the Organizational Engagement Pillar of the Recent Graduate Program - Organized events with leaders across the company to inform recent graduates of efforts and opportunities for involvement.

Academics Committee Chair - ECE Undergraduate Advisory Board

May 2018 – May 2021

- Improved the ECE undergraduate experience by facilitating faculty town hall discussions, connecting students through social events, and directing channels of feedback to faculty and administration.
- Collaborated with faculty from the ECE department to bring about changes to the ECE curriculum, create more relevant four-year plans, reform the general ECE requirements, and tailor technical cores to fit the student's needs.

Professional Director - UT Society of Hispanic Professional Engineers

April 2020 – December 2020

- Revamped professional development pillar by introducing 30 new networking and informational summer events with companies and professionals to better position members for fall recruitment.
- Implemented a mentorship program with SHPE Austin for professionals to mentor and support 34 of our members.
- Led and restructured the professional committee into mutually exclusive roles with added accountability and created a culture of engagement that granted members space and flexibility to contribute.

Embedded System Engineer – *University of Texas Solar Vehicle Team; Austin, TX* September 2018 – April 2020

- Developed, as a team, a battery protection system that disconnected the battery from the car's electrical system if any electrical or thermal parameter was out of range to provide safe operation of the lithium-ion battery system.
- Implemented a system that provided supplemental features such as telemetry output, battery state of charge, pre-charge contactor control, and a driver display to relay the driver with information on the state of the battery.

Student Abroad – *Seisen University; Tokyo, Japan* May 2018 – June 2018

- Challenged to contemplate economic, environmental, and societal implications of rapidly developing nanotechnologies, specifically technical developments in information technology, environmental sensing, energy sustainability and medicine.
- Explored fundamental issues related to intellectual property, the innovative process, international competition and cooperation, the roles of governmental policy, and societal perception of nanotechnology.