ALFREDO REINA CORONA

817-361-2524 | alfredoreinacorona@gmail.com | U.S. Citizen | D1 Track Athlete

EDUCATION

University of Southern California **Expected May 2026**
Master of Science in Computer Science | GPA: 3.15 *Los Angeles, CA*

University of Texas at Arlington **May 2024**
Bachelor of Science in Computer Science | GPA: 3.234 *Arlington, TX*
Unmanned Vehicle Systems Certificate | Certificate GPA: 4.0

PROJECTS

Autonomous Land Rover | Group

- Directed development of an autonomous-capable land rover, managing team collaboration and resolving conflicts to ensure project success
- Optimized a Simulink model to provide the vehicle a more efficient real-time feedback system, contributing to a **22%** decrease in course traversal compared to the original model
- Implemented MQTT to distribute processing tasks to a secondary computer within the network, allowing for near-real-time operation despite hardware limitations
- Created a script to analyze sensor data and identify recurring issues, improving debugging efficiency by correlating errors with common problems
- Consolidated data from multiple internal and external sensors, using Extended Kalman Filters, to autonomously traverse varying outdoor environments

Autonomous Vehicle: Motion Planning & Electronics | Group

- Assumed leadership of a project transitioned from a previous team, overseeing its progression
- Developed a path-planning and motion-planning system using gradient descent to compute and merge visual and LiDAR data, ensuring a locally safe path for the vehicle
- Developed real-time data cleaning scripts to filter out null or outlier values, improving accuracy of sensor testing
- Interfaced ROS2 with the Cube Orange, allowing the vehicle to use IMU measurements for easier calibration.
- Created simulations on ROS2 using Gazebo, allowing for extensive vehicle testing

EXPERIENCE

AutoDrive Lab **April 2025 – Present**
Autonomous Driving Research Intern | Part-time *Los Angeles, CA*

- Researched methods to develop more effective model-free RL policies for mid-to-end driving
- Designed and simulated autonomous driving approaches inspired by top competition results and academic studies
- Test, modify, and create reinforcement learning models for trajectory prediction, intent recognition, and path planning, among other decision-making tasks

Project SPICES LLC **August 2024 – January 2025**
Full-Stack Market Research Intern | Part-time *Los Angeles, CA*

- Developed, deployed, and maintained an internal Full-Stack application to aggregate and analyze financial data from diverse sources, improving data accessibility, enhancing client targeting strategies and market analysis within the company
- Implemented basic ETL and data cleaning scripts to source and consolidate fragmented data into a unified CSV file, decreasing data preparation time by **20%**, leading to more efficient client analysis
- Enhanced data workflow by optimizing company specific algorithms to generate more accurate numerical outputs representing a company's viability for targeting purposes

SKILLS

Programming Languages: Python, C++, C, JavaScript

Technologies: Tensorflow/Keras, Pytorch, ROS2, ROS, CubePilot, Teensy, PostgreSQL, MPC, MuJoCo, CARLA, Gazebo, OpenCV, Point Cloud Library, Micro-controllers, Next.js, SQL, MATLAB, MySQL, Flask, MQTT, Spark, Beautiful Soup, DuckDB, Git , Simulink, CSS, HTML, OBD2, Docker

Operating Systems: Linux, Windows

EXTRACURRICULAR

Track / Cross-Country **August 2021 – Present**
Athlete & Team Captain *University of Southern California | University of Texas at Arlington*

- Refined training regimen, decreasing athlete injury rate by **50%**
- Coordinated with head and assistant coaches to discuss team needs and future plans
- Improved the Cross-Country team's ranking from 20th to 9th in the region by leading team practices, enhancing training plans, and fostering team bonding activities
- Member of a 2x national championship-winning team