Alfredo Reina Corona

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

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 | GPA: 4.0

Projects

Steering VLAs for Safe Robotic Control | Group | Ongoing
- Designing an activation-steering framework for vision-language-action (VLA) models to enforce safe, constraint-aware behavior in robotic systems
- Implementing and evaluating the method on a 6-DoF robot arm for safe manipulation, with a planned extension to quadruped locomotion
- Building Isaac Sim scenarios and a client–server deployment pipeline for low-latency VLA inference and real-time interventions
- Developing mechanistic interpretability experiments to identify safety-relevant activation patterns and quantify the impact of steering on task success and risk reduction.

Autonomous Land Rover | Group
- Directed development of an autonomous-capable land rover, coordinating a multi-disciplinary team
- Optimized a Simulink control model, reducing course traversal time by **22%**
- Implemented MQTT to offload processing to a more capable off-board computer for near real-time performance
- Programmed analysis scripts to inspect sensor logs and identify common failures, speeding up hardware/software debugging
- Fused multiple onboard sensors with Extended Kalman Filters for autonomous localization, mapping, and navigation in indoor environments

Autonomous Vehicle: Motion Planning & Electronics | Group
- Developed a path-planning stack using Kalman filtering and A* search for safe local trajectory generation
- Implemented real-time data cleaning to filter nulls/outliers, improving reliability of sensor validation
- Integrated ROS2 with a CubeOrange controller to utilize onboard IMU+GPS fusion for robust localization
- Created ROS2–Gazebo simulations with realistic sensor/actuator models to validate behavior before deployment

Experience

AutoDrive Lab — **April 2025 – Present**
Student Researcher — Part-time — *Los Angeles, CA*
- Researching model-free reinforcement learning policies for autonomous driving
- Testing, modifying, and validating RL models, simulators, and algorithms for robust AV control

Project SPICES LLC — **August 2024 – January 2025**
Market Research Software Intern — Part-time — *Los Angeles, CA*
- Developed and maintained an internal full-stack web app to aggregate and analyze financial data
- Built ETL and data-cleaning scripts to unify fragmented datasets, reducing prep time by **20%**
- Optimized viability scoring algorithms for more accurate targeting recommendations

Skills

Programming Languages: Python, C++, C, JavaScript
AI/ML/Robotics: TensorFlow/Keras, PyTorch, ROS, ROS2, Stonefish Sim, Isaac Sim, Isaac Lab, CARLA, Gazebo, CubePilot, Teensy, RAG(LLMs), MQTT, MATLAB, Simulink, OpenCV, PCL
Software Engineering: Docker, Git, PostgreSQL, MySQL, DuckDB, Next.js, Django/Django REST, Flask, HTML, CSS, Beautiful Soup

Select Courses

Robot Learning • Extreme Environment Robotic Autonomy • Machine Learning • Machine Learning Optimization • Robotic Perception • Robotics • Deep Learning • Unmanned Vehicle System Development

Extracurricular

Track / Cross-Country — **August 2021 – Present**
Team Captain & Athlete — *University of Southern California | University of Texas at Arlington*
- Team captain of a 2x national championship-winning program
- Established clear accountability standards (attendance, attire, and practice expectations) that improved athlete compliance and reinforced a professional, high-performance team culture.
- Raised UTA Cross Country's regional ranking from 20th to 9th by creating season-long training plans, coordinating team equipment and logistics, and securing additional resources and competitive opportunities