Andres Pulido

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Education

University of Florida, Gainesville, FL
Ph.D. in Mechanical Engineering. **August 2021 - December 2025**
MS in Mechanical Engineering with an Electrical Engineering minor. August 2021 - December 2023

Relevant Coursework and Skills

Autonomous Robots | Nonlinear and Optimal Controls | Reinforcement and Machine Learning | Optimization
Skills: Python, Linux, Git, ROS, Gazebo, C++, Deep Learning, PyTorch, TensorFlow, SKLearn, MATLAB, SolidWorks
Languages: Spanish (native), English (fluent)

Internship Experience

Rivian & Volkswagen Group Technologies - Autonomy Software Systems Engineering Intern May - August 2025
- Created a metric for lateral distance to objects, including designing a safe minimum lateral distance threshold model based on relative lateral velocity and longitudinal speed to assess feature performance
- Implemented the metric and threshold onboard with C++ to find close calls in the fleet of user vehicles
- Assessed the performance of a new object avoidance feature by conducting an A/B test using the metric

Aurora Innovation - Software Safety Engineering Intern May - August 2024
- Wrote a Python tool for coverage analysis of a self-driving truck's behavior deficiencies based on internal planning model metrics, which was able to find improvements in simulations created to test the AV behaviors
- Built a detector that achieved >90% precision for scenarios where the AV saw a vehicle on a separated shoulder

Autonomous Vehicle Lab, UF REEF - Robotics Software Engineering Intern May - August 2022 **&** 2023
- Implemented a particle filter on a quadcopter that estimated the state of a mobile robot even under occlusions
- Learned the dynamics of a robot using a transformer deep neural network and raw position for target tracking
- Reduced tracking uncertainty better than baselines by designing a novel information-driven guidance method
- Designed a Markov chain-like road network and programmed a PID control on a robot to follow the network

Aurora Innovation - Systems Engineering Intern May - August 2021
- Formulated and wrote a Python tool to perform a time-interval safety analysis on excessive longitudinal acceleration fault scenarios of a self-driving car, which helps to understand constraints on safety mechanisms
- Derived one dynamic and three static 2D rollover models of a self-driving truck in Python, which served as the groundwork for the safety team to impose motion planning limits that prevent rollover in different conditions

Research Experience

Active Perception and Robot Intelligence Lab, UF - Graduate Researcher August 2021 - Present
- Implemented a Kinodynamic RRT that generates trajectories for a simulated boat tethered to a drone in Python
- Achieved centimeter accuracy positioning for a bathymetry boat by fusing GPS and IMU with a Kalman Filter
- Created a SAM2-based automatic YOLO labeling tool to perform object detection on side-scan sonar images
- Designed a real-time sparse 3D point cloud generation algorithm using side-scan sonar images
- Created a 6DoF Gazebo simulation for sonar bathymetry of a tethered drone and boat system in C++
- Supervised the development of a complete coverage path planning algorithm for non-convex water bodies
- Mentored six undergrad students on projects such as rudder control, sensor integration, semantic segmentation

Machine Intelligence Lab, UF - Research Assistant
Team Lead and Software Team Member in the autonomous boat and submarine teams August 2018 - Present
- Led a team of students in the 2023, 2022, and 2019 RoboSub competitions in CA and MD
- Implemented a Concurrent Learning-based adaptive controller for the boat that learns system parameters
- Gained a better understanding of the dynamics model of the submarine by performing system identification techniques to estimate inertia and drag parameters with data collected on pool experiments
- Documented an optimization-based thruster mapping ROS node for stable control of the autonomous submarine