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. August 2021 - December 2023

Relevant Coursework and Skills

Autonomous Robots | Nonlinear and Optimal Controls | Intro to RL | Applied ML | Optimization | Formal Methods

Skills: Python, Linux, Git, ROS, Gazebo, C++, TensorFlow, PyTorch, SKLearn, MATLAB, SolidWorks

Languages: Spanish (native), English (fluent)

Internship Experience

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 that 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

Cummins Inc - Product Validation Engineering Co-Op August - December 2020

- Wrote a user interface (UI) using MATLAB App Designer that allows for safer and quicker lift bracket testing
- Analyzed field data to create a tool that finds the most realistic engine temperature in vibration testing
- Optimized testing cost projections by applying in MATLAB statistical techniques to two years of testing costs

Research Experience

Active Perception and Robot Intelligence Lab, UF - Graduate Researcher August 2021 - Present

- Created a 6DoF Gazebo simulation for sonar bathymetry of a tethered drone and boat system in C++
- Implemented to the sim a Kinodynamic RRT that generates trajectories for a boat tethered to a drone in Python
- Achieved centimeter accuracy positioning for a bathymetry boat by fusing GPS and IMU with a Kalman Filter
- Designed a real-time sparse 3D point cloud generation algorithm using side-scan sonar images
- Trained and implemented YOLO to perform side-scan sonar image Automatic Object Detention (ATR)
- 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