Sofia Marquez

Autonomy Engineer

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SUMMARY

Autonomy Engineer with 4 years developing state estimation, motion planning and trajectory optimization for autonomous yard trucks and inspection drones. Writes C++ and Python on ROS 2, trains small PyTorch models, and tests every change in simulation and on the vehicle. Strong written and verbal communication with test, safety and hardware teams.

EXPERIENCE

Autonomy Engineer

08/2023 - Present

Hill Country Autonomous Systems — Austin, TX

Developer of autonomous yard trucks for distribution centers and ports.

- Develop trajectory optimization in C++ for a 40-ton yard truck, cutting trailer hitch time by **35%**.
- Build state estimation fusing RTK GPS, IMU and wheel speed, holding position error under 5 cm in 98% of runs.
- Train PyTorch models for trailer detection and deploy them as ROS 2 nodes running at 30 Hz.
- Maintain CI/CD in Git with 900 simulation tests, catching 60 regressions before field release in 2025.

Robotics Engineer

07/2022 - 07/2023

Lone Star Aerial Robotics — Austin, TX

Drone inspection startup serving bridge and utility owners.

- Implemented sensor fusion for drone navigation under bridges where GPS drops, keeping 30 cm accuracy.
- Wrote motion planning for close-range inspection paths that cut flight time per bridge by 20%.
- Built Python tools to replay 500 flight logs a month for debugging.
- Ran 120 test flights with the safety team, with no hard landings.

Graduate Research Assistant

08/2020 - 05/2022

The University of Texas at Austin — Austin, TX

Aerospace robotics lab working on multi-robot control.

- Developed model predictive controllers for quadrotors, reducing tracking error by 25% in simulation.
- Set up a 3-drone test space with motion capture used by 6 students.
- Wrote C++ trajectory generation code for minimum-snap paths used in 2 lab studies.

SKILLS

C++ • Python

State Estimation

Sensor Fusion

Motion Planning

Trajectory Optimization

ROS 2 • PyTorch • Git

CI/CD

EDUCATION

Master of Science

05/2022

The University of Texas at Austin

Austin, TX

Aerospace Engineering

CERTIFICATES

FAA Part 107 Remote Pilot Certificate

Federal Aviation Administration

09/2022