Daniel Municio

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Education

University of California Berkeley|B.A Data Science |E.G: 2027|GPA: 3.7

Top Accomplishments

- **Built an Autonomous Formula Race Car**- Designed, implemented, and integrated the full autonomous perception, planning, and control pipeline on FSAE EV vehicle, alongside autonomous mechanical and electrical systems, **achieving successful fully autonomous laps.**
- Developed and rigorously tested software for **in-cabin child detection** with UWB radar which **passed all EU NCAP safety test scenarios** for child detection with 100% detection rate within 15 seconds.
- Developed **Drone VLA** to have drone successfully pick up and move objects to different locations when given prompts like "Go pick up the white medical box, and bring it to the other side of the room".

EXPERIENCE

Sensors Engineering Intern - Rivian Automotive   **May 2025 - Aug 2025**
- Developed successful proof-of-concept software for in-cabin child detection with UWB radar.
- Preprocessing algorithms utilize RPCA and FFT which generates a range-doppler plot that feeds into CNN to detect human presence and distinguish between child vs adult
- Saved $35 per vehicle by avoiding traditional mmWave radar sensor for detection on future Rivian vehicles

Student Researcher - BAIR Agile Robotics & Perception Lab   **Aug 2025 - Present**
- Developed Drone VLA to successfully pick up and move objects to different locations via LLM prompts.
- Utilizes DINOv2 and SigLIP vision backbone, feeding into Llama 4 LLM, which is finetuned to output codes for VQ-BeT velocity action codebook learned from EuRoC MAV dataset.
- Successfully tested in warehouse, forest, and office environments in IsaacLab.

Lab Teaching Assistant - Introduction to Robotics   **Aug 2025 - Present**
- Designed & Taught Labs for forward/inverse kinematics, trajectory optimization, computer vision for UR7e's
- Developed safety features for UR7e Robots that define safe zones with Control Barrier Function, which eliminated student accidents via collisions in all lab sections.
- Instructed over 200 students, and received over 50 positive and 0 negative reviews from anonymous feedback

Autonomous Software Lead - Formula Electric Berkeley   **Jan 2024 – Aug 2025**
- Improved Model Predictive Control dynamics to incorporate tire slip with Pacejka, improving model fidelity
- Designed and Integrated GraphSLAM algorithm which improved position accuracy 40% across the first lap.
- Improved perception pipeline from Early Stage to Late Stage Sensor Fusion, which increased speed 3x (10hz->30hz)
- Combined LiDAR and Camera landmark measurements into an EKF with IMU + GPS + WSS measurements to improve GraphSLAM initial pose and landmark estimates, while increasing update speed.
- Integrated Software onto Nvidia Jetson and fully integrated on the 2025 competition vehicle CAN bus.
- **Car drove autonomously**, through a **completely unknown track**, in a competition style setup.

Projects

RC Track Pace Car   **June 2024**
- Automated an RC Car to do laps around a track at a given speed to assist runners.
- Used a playstation camera to detect lines around the track with OpenCV.
- Used PID control to have the car maintain constant velocity with feedback from an IMU and playstation camera data to stay inside the track lane.

Brushless Motor Driver   **November 2024**
- Designed and brought up a 3 phase motor driver for a standard brushless motor with an AS5600 encoder.
- Utilized 3 dual MOSFET's, going into a TMC6200 Gate Driver with an ESP32 to handle current-limiting, velocity control, and voltage sensing.
- Includes decoupling capacitors for noise reduction, and current sensing resistors.