

Samuel Mankoff

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EDUCATION

University of California, Berkeley

Berkeley, CA

Master of Science in Mechanical Engineering (Control of Robotic and Autonomous Systems)

Expected May 2026

Bachelor of Science in Mechanical Engineering; Minor in Aerospace Engineering | GPA: 3.7

May 2025

Relevant Coursework: Advanced Control Design and Systems, Feedback Control of Legged Robots, Digital-Twins

SKILLS

Robotics & Control: ROS 2, MuJoCo, Pyomo, MPC, Reinforcement Learning, MoveIt, CVXPY, IPOPT, OpenCV

Software & Tools: Python, C++, Linux, Git, MATLAB, Simulink, LabVIEW, JavaScript, ABAQUS

Hardware: Universal Robots (UR7e), TurtleBot3, Intel RealSense, Bitcraze Crazyflie, ESP32

Design & Manufacturing: SolidWorks, Autodesk Inventor, 3D Printing, Laser Cutting, Waterjet

EXPERIENCE

TaylorMade Golf | R&D Ball Engineering Intern

May - Aug 2024

- Designed the end-to-end system architecture for a custom low-light testing fixture and automated computer vision pipeline system for the manufacturing line, increasing test throughput by 35% and eliminating manual data entry errors.
- Developed system-level characterization tools to quantify manufacturing defects, analyzing high-volume data to validate product performance against design specifications.
- Collaborated cross-functionally with quality teams to define verification criteria and requirements, translating subjective metrics into objective software logic.

Formula Electric at Berkeley | Vehicle Dynamics Engineer

Jan 2023 – May 2025

- Instrumented steering subsystem with high-resolution sensors to capture vehicle state data, validating dynamic models against real-world telemetry to reduce model uncertainty.
- Processed track data to verify signal integrity and correlate real-world dynamics with simulation models, directly supporting control parameter tuning.
- Validated steering geometry against Ackermann dynamics requirements, conducting sensitivity analysis to quantify bump steer error and ensure cornering stability.

PROJECTS

Remote Teleoperation with Computer Vision | ROS 2, Python, Computer Vision, UR7e

Aug – Dec 2025

- Architected a real-time teleoperation interface (<100ms latency) bridging a Meta Quest 3, Intel RealSense camera, and UR7e robot arm via ROS 2, implementing an algorithm to translate VR controller inputs into safe, singularity-free kinematic trajectories
- Implemented a data collection pipeline to log synchronized joint states at 2Hz for Imitation Learning, solving data scarcity for autonomous manipulation tasks.
- Verified the robustness of the perception pipeline by testing object detection failure modes under varying lighting conditions and occlusion scenarios.

Autonomous Quadcopter Landing on Moving Platforms | Python, Pyomo, IPOPT, CVXPY

Aug – Dec 2025

- Formulated a Constrained Finite Time Optimal Control (CFTOC) problem for trajectory generation, optimizing for dynamic feasibility and collision avoidance in a non-convex space
- Engineered a high-frequency NMPC solver that handles nonlinear dynamics and wind rejection, achieving a 45° pitch capability that outperformed baseline linear QP solvers.
- Engineered a hierarchical control architecture with a Finite State Machine (FSM) to segment flight phases (Approach, Sync, Land), ensuring precise trajectory tracking of the moving target while satisfying strict actuator bounds

Custom Embedded Flight Controller | C++, Sensors, State Estimation

Aug – Dec 2024

- Integrated IMU, optical flow, and range sensors to engineer a state estimation pipeline, enabling stable indoor hovering and pitch control to navigate a vertical–horizontal–vertical path through an obstacle course without GPS.
- Implemented high-frequency closed-loop control algorithms in C++ on an embedded microcontroller, optimizing motor mixing matrices for aggressive response.
- Conducted real-world flight tests to tune PID gains and validate estimator convergence and control performance, achieving a landing accuracy of ≤ 11 cm.