Mia LaRocca

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Technical Skills

Languages: Python, C++, C, MATLAB
Libraries & Tools: PyTorch, NumPy, Scikit-learn, OpenCV, Qt, ROS, Git, Linux, Docker
Core Areas: Machine Learning, Computer Vision, Robotics Control, Motion Planning, State Estimation, Software Design

Experience

Aurora Flight Sciences Cambridge, MA, USA
Robotics Engineer Aug 2020 – May 2023

- Developed and integrated autonomy software features in C++ and Python to enhance unmanned aerial system (UAS) mission capability.
- Served as Autonomy Subteam Lead, responsible for behavior design, software architecture, and system integration across multiple aircraft autonomy projects.
- Led machine learning research under DARPA DITTO, generating LTSpice circuit datasets and building Python-based neural surrogate models to replicate circuit behavior.
- Directed and mentored three interns, overseeing task planning, code reviews, and progress presentations.

Jet Propulsion Laboratory (NASA JPL) La Cañada Flintridge, CA
Systems Engineering Intern Jun 2019 – Aug 2019

- Worked on material for Mission Scenario Tests for an earth orbiting satellite, including radar operation sequence table generation and sequences for the deployment and commissioning test.
- Analyzed pass timelines to create a satellite deployment plan which is robust to off nominal deployment dates and orbit tracks.
- Wrote scripts in MATLAB to detect abnormal operation during deployment test scenarios.

MIT Space Telecommunications, Astronomy, and Radiation Lab Cambridge, MA
Undergraduate Researcher Jun 2017 – May 2018

- Designed a 1.4U CubeSat optical payload in SolidWorks for a low Earth orbit mission.
- Performed finite element analysis to ensure structural integrity under launch vibration conditions.

Education

Keio University Tokyo, Japan
M.S. in Engineering (Dual Degree) Sep 2023 – Sep 2025
University of Genoa Genoa, Italy
M.S. in Robotics Engineering (Dual Degree) Sep 2023 – Sep 2025
Massachusetts Institute of Technology Cambridge, MA
B.S. in Aerospace Engineering, Minor in Music Sep 2016 – Jun 2020

Projects

More details in portfolio (miajl.github.io)

Play-LMP for Bi-Manual Robots (Master's Thesis) – *PyTorch, Python, OpenCV, ROS, C++*
Developed and implemented a self-supervised learning framework for bi-manual robotic manipulation, extending prior single-arm Play-LMP research:

- Designed and trained a visuomotor control model that learns from unlabeled teleoperated play data instead of expert task demonstrations.
- Built a dual-arm teleoperation setup to collect synchronized robot and vision data for model training.
- Achieved improved trajectory reconstruction accuracy and demonstrated distinct latent task representations through visual feature encoding.
- Proposed model tuning and architectural refinements for improved real-world deployment performance.

Robotics Science and Systems Capstone Project – *C++, Python, ROS, LiDAR, PID, RRT*, Pure Pursuit*
Implemented a full autonomous navigation stack for a small robot car:

- Built a particle filter for localization using odometry and LiDAR data.
- Implemented RRT* for path planning and PID + pure pursuit for closed-loop control.
- Navigated a preplanned course at 4 m/s and performed real-time obstacle avoidance in unmapped environments.