MAURICIO PEREIRA

Robotics at MIT

EDUCATION

Massachusetts Institute of Technology – December 2026

Bachelor of Science in Mechanical Engineering, Concentration in Control, Instrumentation, and Robotics

Relevant Coursework:

- Robotic Manipulation
- Introduction to Robotics
- Dynamics & Controls
- Design & Manufacturing
- Mechanics & Materials
- Fundamentals of Programming
- Numerical Computation for Mechanical Engineers

Miami Dade College – July 2023

Associate of Arts, Mechanical Engineering

AWARDS

 Highest Scoring Award: Mobile Robot (MIT's Introduction to Robotics Term Project Competition)

SKILLS

- Electromechanical Design
- Mechanical Fabrication
- Robot Kinematics & Dynamics
- ROS and Drake
- Python and C++
- MATLAB
- SolidWorks
- Machine Learning
- System Troubleshooting
- Meticulous attention to detail
- Spanish
- Outstanding communication skills
- Microsoft Office Suite

RELEVANT EXPERIENCE

Robot Design & Manufacturing – MIT Mechanical Engineering Competition

Massachusetts Institute of Technology – Department of Mechanical Engineering January 2025 – Present

- Designed and built a **competitive robot** for MIT's 2.007 Mechanical Engineering competition.
- Applied structured design methodologies (Decision Matrix, Pugh Chart) and Mechanical Engineering calculations to define requirements, select strategy, and design the robot.
- Developed CAD models in SolidWorks, simulated and analyzed performance using MATLAB, and programmed robot control systems in C++ for both autonomous and remote operation via custom mobile app.
- Fabricated components using **machine shop tools** such as milling machine, lathe, waterjet, laser cutter, and 3D printer.
- Integrated **electrical and embedded systems**, selecting and programming microcontrollers, sensors, motors, and power systems.

Mobile Robot – MIT Introduction to Robotics Term Project Competition Massachusetts Institute of Technology – Department of Mechanical Engineering January 2025 – May 2025

- Developed software for an autonomous mobile robot in a team-based competition using a state machine, Python, and C++.
- Achieved the Highest Scoring Award: Mobile Robot, driven by successful autonomous alignment protocols using computer vision to detect and align with AprilTags for navigation and task execution.
- Coordinated with a **UR5 robotic arm**, designing interaction protocols for collaborative object handling, where the mobile robot positions bins for bottle placement.

Optimization of Computer Vision Dataset Creation Undergraduate Researcher

Massachusetts Institute of Technology – Signal Kinetics Group of MIT Media Lab June – August 2024

- Developed a dataset using the YCB dataset (50 objects) to support **computer vision models** for robotic Non-Line of Sight (NLOS) perception.
- Developed a novel synchronization method between a **Universal Robot arm** and mmWave radar, with potential to reduce capture time by **66%** (from 3 hours to 1 hour per object).
- Automated radar measurement collection using **MATLAB**, Python, and Lua, improving consistency and reducing potential manual errors.

Automation of Maskless Lithography System

Research Intern Florida International University – Pozdin Lab May 2022 – January 2023

- Built a MATLAB-based control interface for microscope stage movement, reducing fabrication time from 2 weeks to 3 hours for precise microstructure creation (e.g., creating the letters "FIU" within tenths of micrometers).
- Translated complex project requirements from interdisciplinary fields (e.g. microfluidics) into actionable software specifications.
- Measured and integrated hardware-specific parameters (e.g., microscope stage speed/precision, light beam size/intensity) into control software for optimized performance.
- Initiated and led technical discussions with engineers at Applied Scientific Instrumentation to incorporate their expertise in complex biological experiment automation into the development of our automation process.

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