

# Nicholas Mattos

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## EDUCATION

### Stevens Institute of Technology – Hoboken, NJ

Expected Graduation: May 2026

*Master of Engineering in Mechanical Engineering* | Concentration in Robotics and Control

*Graduate Certificate in Robotics and Control* | *Graduate Certificate in Medical Devices* | GPA: 4.0

### Seton Hall University – South Orange, NJ

Graduation: December 2024

*Bachelor of Science in Physics* | GPA: 3.87

## EMPLOYMENT

### MICRO, *Automation/Process Development Engineering Co-op* – Somerset, NJ

Jan 2026 – Present

*Contract medical device manufacturer producing components, assemblies, and robotic systems in regulated environments*

- Designed and implemented robotic automation solutions, including FANUC programming (TP/KAREL), sensor integration, PLC-based control logic, and EOAT/fixturing design.
- Developed and integrated PLC-based control systems using Allen-Bradley Studio 5000 Logix Designer and AutomationDirect platforms, enabling robot-PLC communication, I/O mapping, coordinated control, conditional actuation, HMI design for operator interaction, and MES integration across work centers.
- Led development of an AWS Quick Suite, an integrated AI tool for natural language querying of manufacturing data, while supporting process development and validation (IQ/OQ) in an FDA/ISO regulated GMP environment.
- Assisted in FAT/SAT for semi-automated crimping cell for high precision cryogenic surgical tools.

### EN-POWER GROUP, *Mechanical Design Engineering Intern* – New York, NY

May 2024 – Present

*Mechanical and energy engineering consulting firm serving commercial and residential buildings*

- Conduct building area measurements for 100+ contracts totaling \$500,000+ using AutoCAD, supporting energy efficiency compliance for NYC LL97/LL84 benchmarks.
- Collaborate on HVAC system design, load calculations, equipment sizing, and submittal review.

### Stevens Institute of Technology, *Graduate Research Assistant* – Hoboken, NJ

Sep 2025 – Present

*Advisor: Professor Long Wang | Funded by the Department of Defense (DoD)*

- Collaborate with Medtronic and Corvid Technologies and under contract with the Defense Health Agency.
- Develop a robotic end effector for combat casualty care based on design inputs provided by the DoD.
- Integrate hardware control, 3D-printed assemblies, and SolidWorks-based design to support prototype validation and future Food and Drug Administration (FDA) activities.

### Stevens Institute of Technology, *Graduate Teacher Assistant* – Hoboken, NJ

Jan 2025 – Present

- TA for Fluid Mechanics ME 342 (Spring 2025) and Engineering Analysis I ME 641 (Fall 2025 and Spring 2026).

## PROJECTS

### Autonomous Mobile Robot Sorting & Navigation

- Engineered a state-based control and navigation system for a differential-drive robot, enabling autonomous identification, sorting, and relocation of colored objects in simulation.

### Kinematic Modeling & Simulation of a 5-DOF Robotic Manipulator

- Developed forward and inverse kinematic algorithms to model robotic motion, validate workspace constraints, and optimize end-effector trajectory planning.

### Vision-Based Object Detection & Localization Pipeline for Autonomous Navigation Application

- Engineered a computer vision pipeline for object detection and spatial localization, processing visual data to accurately identify and map obstacles for autonomous navigation systems.

### IMU Sensor Fusion & State Estimation

- Implemented a Kalman Filter-based sensor fusion algorithm to estimate orientation from IMU data, mitigating noise and drift for improved state estimation

### Path Planning with Uncertainty Analysis (RRT + KF)

- Developed an RRT-based path planner and applied a Kalman Filter to predict localization uncertainty across paths, analyzing tradeoffs between path length and anticipated uncertainty.

## TECHNICAL SKILLS

**Software/Programming:** MATLAB, Simulink, Python, PLC Ladder Logic, HMI Design, Arduino, TP/KAREL (FANUC), ROS 2, C++

**CAD/Design:** SolidWorks, AutoCAD, Creo, Fusion 360, FEA, 3D Printing, GD&T

**Languages:** Spanish (Intermediate), Greek (Elementary)

**Familiarities:** ISO 9001, ISO 14001, ISO 13485, 21 CFR Part 820, GMP Documentation Practices, Design Control, IQ/OQ Validation

**Additional Skills:** Analysis (Minitab), Data Analysis (Excel), MES Integration

**Awards:** Dean's List (all semesters), Eagle Scout, FRHSD Award (Perfect SAT Math Score), Sigma Pi Sigma (Physics and Astronomy Honor Society)