




# Liam Joseph Nolan


Mechatronic Engineer




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## About me

I am a Mechatronics Engineer with over four years of professional experience in Medical Robotics, Software, and Manufacturing. I am currently pursuing a Master's degree in Mechatronics at MCI. I am passionate about Robotic Design, and Software. I am currently looking for Full-Time work.

## Personal

**Location:** Innsbruck, Austria

**Nationality:** USA

**DOB:** 1997

## Language

**English:** Native

**German:** Basic

## Skills

Python	Solidworks
MatLab	Inventor
ROS2	GDNT
Simulink	DFMEA
C++	FEA
Linux	Ansys
YAML	
HTML	
CSS	CNC Mfg
Git	MasterCAM
Jekyll	BobCAM
OpenCV	3D Printing
CI/CD	Waterjet
Github Actions	Laser Cutting

## PROFESSIONAL EXPERIENCE

### Mechatronic Engineer

2019–2023

Ethicon Inc.

Santa Clara, CA

- Designed, tested, and implemented robotic subsystems.
- Diagnosed and debugged system-level software issues in clinical settings.
- Led project to develop a mechanical immobilization solution for the surgeon console.
- Managed capital equipment packaging project as Team Lead.
- Designed and coordinated manufacturing of PCB and optical test fixtures.
- Directed repair efforts for surgical robotic systems in clinical settings.
- Supported surgical procedure development in lab environments.

### Mechatronic Intern

2018

Auris Health

Santa Clara, CA

- Designed and manufactured immobilization actuator for a surgical system.
- Assembled, tested, and characterized robotic arm performance.
- Tuned, characterized, and tested a custom electromechanical actuator.
- Analyzed critical tolerance stackups in custom actuator assemblies.
- Created, reviewed, and delivered part drawings for manufacturing.

### Mechanical Engineering Intern

2017

Orbital ATK

Goleta, CA

- Prototyped assembly methods for various satellite deployables.
- Assembled and tested engineering development units.
- Inspected flight hardware for defects and verified assembly tolerances.
- Manufactured and assembled stiffness and thermal test fixtures.

### Mechanical Engineering Intern

2015–2016

Breedt

Kent, WA

- Designed, manufactured, and tested large-scale industrial tooling.
- Responsible for mechanical and electrical design of a robotic hydroponic foam cutter.
- Designed and manufactured a rubber compression mold stripper.
- Operated CNC manufacturing equipment to fabricate parts for external customers.

## ACADEMICS

### M.Sc in Mechatronics

MCI | Innsbruck, Austria

October 2023 – July 2025

### B.Sc in Aerospace Engineering

Calpoly San Luis Obispo | USA

September 2015 – June 2019

**Master's Thesis:** Implementing Adaptive Control in ROS 2 for a Laparoscopic Surgical Robotic Test Platform

In Progress:

- Creating Custom C++ ROS 2 Packages
- Writing Adaptive Control Algorithm

## INVOLVEMENTS

### FIRST Robotics:

FRC Team 2046 (President)

FRC Team 973 (Mentor)

2017 FRC World Champion

### BattleBots:

Sole Engineer on Alexis

Lead Engineer on Zenith

### PolySat:

Aero Team

ISX Radiation Lead

## Hobbies

Rock Climbing

Ski Touring

Photography

Cycling

Guitar

Aquariums

## PERSONAL PROJECTS

### Web scraper:

Developed a Python script to scrape data from a local climbing gym's website to monitor its capacity. Automated the process using GitHub Actions and created a Flask app to export the data in JSON format. Dockerized the codebase and deployed it as an API endpoint on Render, while also implementing an HTML script to visualize the data on my website.

### Trajectory Tracker:

Developed a Python application utilizing the OpenCV library for advanced vision processing to track, plot, and predict the trajectory of a thrown ball in video footage. The project captures real-time position, velocity, and acceleration data for each frame, providing a comprehensive analysis of projectile motion. Leveraged computer vision techniques to enhance accuracy and reliability of tracking.

### Delta Manipulator:

Utilized MATLAB, Simulink, and Simscape Multibody to model and simulate an IGUS Delta Manipulator. Developed a desired trajectory for the end effector using trapezoidal velocity profiles. Applied inverse kinematics to compute joint positions corresponding to the desired trajectory, followed by forward kinematics to update the end effector's position within the Simscape model.

### Weather Frog:

Built a Python script that displays the current weather of a chosen city in a Linux terminal. It fetches data from the OpenWeatherMap API using the 'requests' library, then presents it in a formatted table with the PrettyTable library. The script also includes a friendly frog mascot that shares additional weather insights.

### TurtleBot Factory:

Designed custom hardware for the TurtleBot4 to facilitate the reception and delivery of syringe blocks. Developed custom ROS2 packages for multi-robot navigation and docking, utilizing LIDAR and the Navigator for collision avoidance and efficient robot pathing.

### Turtlesim Edge Detection:

Developed a custom C++ node for ROS 2 that spawns a simulated TurtleBot at a random orientation. The robot autonomously drives forward, utilizing edge detection to identify boundaries. Upon detecting an edge, it executes a 90-degree turn, logs "Edge Detected" in the terminal, and continues moving. Installation is simplified through a custom Bash script for easy deployment.

### Dice Sorting Robot:

Developed an automated sorting system using an ABB robot arm and Cognex camera to track and sort dice. Move instructions were programmed in RAPID, with vision processing handled by a custom Cognex application. The robot picked up dice from a tray, placed them on a conveyor, and sorted them continuously until stopped by the user.

### Climbing Data Tracker:

Created a tool to log and analyze climbing training data, with entries recorded in markdown format via Obsidian. A Python parser extracts key details, which are processed by a backend service and displayed on a web-based dashboard with interactive graphs. The backend, deployed as a Dockerized API endpoint on Render, powers the frontend's data visualization.