Liam Joseph **Nolan**

Senior Mechatronics Engineer

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About me

I am a Mechatronics Engineer with over four years of professional experience developing complex robotic systems. Previously specializing in medical robotics I am currently developing construction robotics as apart of the team at Rockslice.

Language

English: Native
Norwegian: Basic
German: Basic

Skills

Python
MatLab
ROS2
Gazebo
RIVZ
MicroROS
Simulink
C++
Linux
YAML
HTML
Git
OpenCV
CI/CD
Github Actions

Solidworks
Onshape
Inventor
Fusion 360
GDNT
DFMEA
FEA
Ansys

CNC Mfg
MasterCAM
BobCAM
3D Printing
Waterjet
Laser Cutting

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

Experience

Senior Mechatronics Engineer — Rockslice
Sept 2025-Present — Bergen, NO

- Served as primary engineer on robotic concrete cutting platform
- Utilized Onshape to design and develop next generation of water driven concrete saw
- Released mechanical drawings for manufacturing in adherence to GD&T standards
- Integrated 6DOF robotic arm to act as a testing platform for prototype hardware

Master's Thesis — MCI
2025-2026 — Innsbruck, AT

- Modeled and simulated a desktop surgical robotic system using Gazebo and RViz
- Developed a modular ROS 2 software architecture in C++
- Analyzed system kinematics and implemented trajectory planning algorithms
- Conducted system identification via closed-loop PRBS excitation
- Designed and implemented an LQI controller with feedforward compensation
- Evaluated control system performance through simulation and experimental testing
- Targeting publication in IEEE Transactions on Medical Robotics

Mechanical Engineer — Ethicon Inc. (Formerly Auris)
2019–2023 — Santa Clara, CA

- Project lead of surgeon console immobilization system
  - *US20230390010A1 and WO2023238053A1 Patents pending*
- Designed, tested, and implemented robotic subsystems for surgical robotic system.
- Diagnosed and debugged system-level mechanical and 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.

Mechanical Engineering Intern — Ethicon Inc. (Formerly Auris)
2018 — 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 — Orbital ATK
2017 — Goleta, CA

- Prototyped assembly methods for 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 — Breedt
2015–2016 — 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.

Other 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

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.

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.

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

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.

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 position within the Simscape model.

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.

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.

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.