

# Nathan Ramirez

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## Education

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### Boston University

Boston, MA

*Bachelor of Science in Biomedical Engineering & Concentration in Robotics*

Expected May 2027

*Relevant course work: Engineering Robotics, Chemistry II, Anatomy & Physiology, Engineering Design, Physics II, ENG BE 403 (Biomedical Signals and Controls), ENG BE 420 (Introduction to Solid Biomechanics)*

### Northeast Medical Institute

East Hartford, CT

*Phlebotomists certification*

June 2025 - July 2025

## Experience

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### Gems Home Improvement

Hartford, CT

*Contractor and Contract Negotiations*

May 2022 - February 2025

- Facilitated negotiations between property managers and contractors by translating Spanish and Portuguese, while proposing efficient workflow alternatives that maintained quality standards across 50+ projects
- Led onsite teams of 2-10 workers in lumber, welding, and construction operations, coordinating efforts that completed a major project one year ahead of schedule
- Designed electrical box layouts and wiring plans for three commercial buildings through collaborative input sessions, ensuring code compliance while addressing stakeholder requirements

## Projects

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### Surgical Gantry Robot

- Designed and built a precision gantry robot with pulley-driven stepper motors and lead-screw motion, featuring interchangeable, sensor-integrated tool heads for incision, tissue spreading, and soft gripping
- Implemented computer vision-based workspace recognition and configured a control system for semi-autonomous operation, adapting to variable materials and conditions with validated, stress-tested parts

### Autonomous Line-Following Robot

- Collaborated with 3-person team to develop computer vision system using HSV thresholding for robust line detection, coordinating coding efforts before delegating to computer engineer to leverage expertise
- Streamlined project workflow by troubleshooting detection issues to eliminate resubmission cycles, then took ownership of technical documentation
- Implemented real-time image processing with ROI cropping and successfully navigated multi-color intersection maze through systematic parameter optimization

### Remote Controlled 'Battlebots'

- Led cross-functional team of 5 students (BME, EE, Psychology) by assigning roles based on individual strengths and maintaining project momentum when team members fell behind, ensuring competition readiness
- Spearheaded manufacturing and integration efforts, personally fabricating metal plates, wood panels, electrical systems, and wheel assemblies while mentoring teammates on system architecture
- Designed competition-ready robot in Onshape with spring-loaded launcher and 6-meter operational radius, programming ESP32 for wireless control and performing live repairs during tournament

### Eye Tracking Software

- Built visualization features including live overlays and edge-detection sessions for debugging, achieving 80% accuracy in pupil localization across multiple video samples and lighting conditions

**Full Portfolio available upon request**

## Skills

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**Coding Languages:** C++, Python, Java, Matlab

**Software Skills:** MATLAB, Canva, Microsoft Teams, Onshape, Solidworks, Cad Drawing, Arduino IDE, ORCA slicer, BambuLab, KICAD

**Technical skills:** Soldering, Welding, Microcontroller programing, 3D printing, Laboratory Equipment Training

**Language Skills:** English(Fluent), Spanish(Fluent), Portuguese(Proficient), Italian (Proficient)