

# Siyu Liu

Boston, MA (Open to Relocate) | [liu.siyu5@northeastern.edu](mailto:liu.siyu5@northeastern.edu) | [LinkedIn](#) | [GitHub](#) | [Portfolio](#)

## Education

**Northeastern University** | Boston Campus

May 2026

**Master of Science in Robotics, Concentration in Electrical & Computer Engineering**

Courses: Reinforcement Learning, Algorithms, Sensing and Navigating Robotics, Assistive Robotics

**China University of Mining and Technology** | Xuzhou, China

Jul 2023

**Bachelor of Engineering in Mechanical Engineering**

Courses: Mechanical Design, Microcomputer Principles and Control, PLC Control System, Fluid Mechanics, Thermodynamics

## Skills

**Programming & Data:** Python, MATLAB; NumPy, Pandas, SciPy, Matplotlib, Regex

**AI & Robotics:** Scikit-Learn, PyTorch, TensorFlow, Keras, RL (PPO); ROS, Gazebo, RViz

**CAE & Tools:** SolidWorks, ANSYS, Abaqus; Git, MS Office

## Projects

**Autonomous Differential-Drive Steering System for Pothole Avoidance** | Boston

Feb 2025 – Present

- Built 2-wheel platform with TOF + IMU sensing; real-time steering avoids 95 % potholes in test track
- Trained PPO policies in PyBullet and deployed to Arduino Niela Vision with seamless on-device inference

**Synchronization & Coordination of Two Mobile Robots** | Boston

Oct 2024 – Dec 2024

- Configured a dual-TurtleBot3 SLAM stack in ROS 1/Gazebo—gmapping + AMCL + move\_base—so each robot could map, localize, and navigate autonomously in a custom world
- Engineered multi-robot integration: namespace-isolated launch files and a custom map\_merge node fused the two occupancy grids into one live map and eliminated TF-frame collisions
- Debugged cross-package TF/topic conflicts (slam\_gmapping ↔ explore\_lite), documenting fixes and a scaling roadmap—experience that sharpened ROS troubleshooting and multi-robot coordination skills

**Networked Agro-Forestry Monitoring Pan-Tilt** | China

Sep 2022 – Jun 2023

- Engineered a 3-axis electric turntable in SolidWorks/ANSYS: hollow 6061-T6 frame shaved weight 40 % to 14 kg yet survives 1.6 N·m loads with 83 % safety margin and 270 Hz first-mode frequency
- Built an STM32F103 control stack—quad-encoder + MPU-6050 fusion, quaternion-to-Euler solver, incremental PID—achieving  $\leq 0.05^\circ$  pointing repeatability while multi-stage DC-DC and MCU standby cut idle power  $\approx 30\%$
- Delivered 47 CAD drawings, full BOM, and modular quick-swap motor/PCB trays ( $\leq 5$  min field service); design lowers material cost  $\approx 40\%$  and sets a roadmap for solar + 5G/edge-AI upgrades to enable unmanned agro-forestry monitoring

**Design of Intelligent Sorting System of Robotic Arm Based on Voice Control** | China

Nov 2022 – Dec 2022

- Designed scanning detection and voice recognition modules using Altium Designer to support the robotic arm's sorting system
- Implemented image recognition system using Halcon to drive the conveyor belt and automatic control
- Utilized Arduino to write programs to control small lights and robotic arms through buttons and voice recognition modules connected to the micro-controller

**Natural Field Electromagnetic Exploration System** | China

Sep 2020 – Jan 2022

- Designed the mechanical structure of suspended pod to carry the exploration system safely against vibrational forces
- Patent: Siyu Liu. 2022. Pod-type aviation low-frequency three-component natural field electromagnetic exploration system and control method. CN 114355459 A, filed January 7, 2022, Patent Pending.*

## Experience

**Institute of Electrical and Electronic Reliability, Harbin Institute of Technology** | Harbin, China

Jul 2023 – Apr 2024

CAE Engineer

- Simulated insertion/extraction forces and contact resistance of rocket connectors using Abaqus to predict mechanical performance under real-world conditions
- Verified temperature rise and harmonic response of aerospace connectors with ANSYS to ensure compliance with requirements
- Reduced validation cycle by 20% by comparing stress relaxation simulation data with lab results, and delivered actionable insights to manufacturers for product improvement

**Baosuo Machinery Manufacturing Co., Ltd** | Foshan, China

Jul 2022 – Aug 2022

R&D Center Assistant

- Modeled 20+ drive components; GD&T drawings trimmed revision cycles 25 % and sped prototype release
- Ran clash-detection/quick FEA, leading 10-engineer review that removed 15 recurring jams and raised uptime 8 %

## Extracurricular Experience

**RoboMaster Robotics Competition** | Harbin, China | National First Place

Jan 2020 – Oct 2021

- Co-designed a RoboMaster robot in SolidWorks and ran battle simulations to iterate and resolve design flaws