

# Siyu Liu

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

## Education

**Northeastern University** | Boston

May 2026

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

Courses: NLP, Machine Learning, Reinforcement Learning, Robotic Sensing & Navigation, Assistive Robots

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

Jul 2023

Bachelor of Engineering in Mechanical Engineering

Courses: Python, Electrical and Electronic Technology, Mechanical Design, Microcomputer Control, PLC

## Skills

**Languages:** Python (MATLAB)

**ML / DL / NLP:** PyTorch, TensorFlow, Keras, Scikit-Learn; CNN, RNN/LSTM, GNN, Transformer; Reinforcement Learning (PPO)

**Data & Robotics:** NumPy, Pandas, ROS 1/2, Gazebo, RViz

**Engineering:** SolidWorks, ANSYS

**Tools:** Git, MS Office

## Experience

**Harbin Sagebot Intelligent Medical Equipment Co., Ltd.** | Harbin, China

Apr 2024 – Aug 2024

Mechanical Design Engineer

- Designed the main arm and crossbeam of a surgical robot, optimizing joint layout, load distribution, and modular assembly for precision, reliability, and ease of maintenance
- Developed and maintained 3D models and detailed manufacturing drawings in SolidWorks/CATIA; ensured assembly feasibility and adherence to ISO surgical device standards through tolerance analysis
- Supported prototype assembly, simulation, and alignment calibration; identified structural deviations and improved positional accuracy through iterative design refinements

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

Jul 2023 – Apr 2024

CAE Engineer

- Built detailed FE models of aerospace electrical connectors in Abaqus, modeling pin-socket contact, nonlinear materials, and frictional behavior to simulate insertion/extraction forces and contact resistance
- Performed thermal–electrical coupling and harmonic response analyses in ANSYS to identify heat concentration and vibration resonance; proposed structural changes reducing stress by 12%
- Automated post-processing with Python, extracting von Mises stress, displacement, and temperature data; validated model accuracy through correlation with experimental fatigue tests

## Projects

**2D CAD Sketch Constraint Recognition with Machine Learning** | Boston

Present

- Developing ML pipeline to automatically identify 2D CAD sketch constraints using GNN, Random Forest, and XGBoost
- Preprocessing SketchGraphs dataset into graph structures, engineering features, and addressing class imbalance
- Aiming to achieve high F1-score and significantly reduce manual sketch annotation workload

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

Feb 2025 – Jun 2025

- 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 Nicla Vision with seamless on-device inference
- Calibrated sensors and optimized sensor fusion to ensure robust performance across varying surface conditions

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

Oct 2024 – Dec 2024

- Set up dual TurtleBot3 SLAM stack in ROS, Å01/Gazebo, enabling autonomous mapping, localization, and navigation
- Integrated robots with namespace-isolated launch files and a custom map\_merge node, resolving TF/topic conflicts and fusing occupancy grids into one live map

**Natural Field Electromagnetic Exploration System** | China

Sep 2020 – Jan 2022

- Led a 6-member team in designing the suspended pod's mechanical structure to ensure stability under vibrational forces
- Awarded National Silver Medal in Mechanical Design Competition for innovative system design
- 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.

## Extracurricular Experience

**Northeastern University Entrepreneur Club** | Boston, MA | Founder, Entrepreneurship Competition

Present

- Founded and led a team to design a robotics community platform, overseeing vision, roadmap, and prototype development

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

Jan 2020 – Oct 2021

- Co-designed a RoboMaster robot in SolidWorks and performed battle simulations to identify and resolve design flaws