Siyu Liu

Boston, MA (Open to Relocate) | 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: 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: Mechanical Design, Microcomputer Principles and Control, PLC Control System, Fluid Mechanics, Thermodynamics

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
CAE: SolidWorks, ANSYS, Abaqus

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

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 %

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

Synchronization & Coordination of Two Mobile Robots | Boston *Oct 2024 – Dec 2024*

- Set up dual TurtleBot3 SLAM stack in ROS‚ÄØ1/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

Networked Agro-Forestry Monitoring Pan-Tilt | China *Sep 2022 – Jun 2023*

- Engineered 3-axis turntable (SolidWorks/ANSYS), 40% lighter yet 83% safety margin, 270 Hz modal
- Developed STM32F103 control: quad-encoder + MPU-6050 fusion, ⩽ 0.05° accuracy, 30% standby power cut
- Delivered 47 CADs, BOM, quick-swap trays (<5 min), enabling 40% material savings and edge-AI upgrades

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.*

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