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: 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

Languages: Python, MATLAB
Data & Visualization: NumPy, Pandas, SciPy, Matplotlib, Regex
ML / DL: Scikit-Learn, PyTorch, TensorFlow, Keras; Reinforcement Learning (PPO)
Robotics: ROS 1/2, Gazebo, RViz
Biomechanics / Signal: Force-plate analysis, COP alignment, signal resampling
CAD / CAE: SolidWorks, ANSYS, Abaqus
Productivity / Tools: MS Office, Git

Projects

Autonomous Differential-Drive Steering System for Pothole Avoidance | Boston *Feb 2025 – Present*

- Built a two-wheel robot platform integrating a time-of-flight sensor and IMU data to detect uneven terrain and make real-time steering corrections
- Developed and tested PPO reinforcement-learning algorithms in PyBullet, refining control strategies for stable navigation
- Streamlined model deployment on an Arduino Nicla Vision board, ensuring transfer of trained policies to physical hardware

Assistive Exoskeleton Technology Research | Boston *Oct 2024 – Jun 2025*

- Automated a Python pipeline (Pandas, NumPy, regex) that ingests, cleans, and time-aligns hundreds of wearable-sensor files—cutting raw-to-ready prep from hours to ~10 min and boosting usable samples by 30 %
- Designed and trained TensorFlow models (CNN, LSTM, TCN) to predict gait phase; the streamlined data flow halved experiment cycles and raised validation accuracy to ≈ 91 % macro F1

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

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

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