Eric Xiao, EIT

eric.xiao.me@gmail.com | linkedin.com/in/eric-xiaoy | github.com/sixym3 | sixym3.github.io

Education

Stony Brook University — Stony Brook, NY

Master of Science in Mechanical Engineering (Accelerated BS/MS Program) — *May 2025 – December 2025*

Bachelor of Science in Mechanical Engineering — *September 2020 – May 2025*

Experience

Experimental Systems Research Assistant — September 2025 – Present

Stony Brook University – Interacting Robotic Systems Laboratory — *Stony Brook, NY*

- Implemented a Sim-to-Real PyTorch framework that correlates FEA-simulated deformation maps with visual tactile sensor data, enabling real-time shear and normal force estimation without discrete force sensors
- Engineered a custom validation setup to execute repeatable motion profiles for ground-truth model benchmarking

Mechanical Engineer Intern — June 2025 – December 2025

Brookhaven National Laboratory – National Synchrotron Light Source II — *Upton, NY*

- Developed a UR-agnostic motion planning stack integrated into BlueSky to orchestrate dynamic tool changing (vacuum, gripper, pipettor), automating a proof-of-concept in-situ experiment to overcome beamline safety constraints
- Designed a microcontroller-driven robotic pipettor with RS485 communication and solved complex VM networking challenges to unify hardware drivers, delivering a precision liquid-handling solution for the beamline
- Engineered a teleoperation bridge that mapped a Standard Open arm to a UR5e cobot for high-fidelity data collection, which supported training of Action Chunking Transformer policies and validated end-to-end imitation learning

Embedded Systems and Controls Engineer — June 2024 –– May 2025

Stony Brook Rocket Team – NASA Student Launch Initiative — *Stony Brook, NY*

- Led implementation of avionics, embedded software, and electronics integration through all NASA design reviews
- Engineered a multi-threaded telemetry system in C++ for a resource-limited payload, encoding flight data into APRS packets and validating transmission with Direwolf, which ensured reliable real-time data downlink during flights

Projects

Cobot Trajectory Planning | *Python, Motion Planning, Kinematics* — November 2025 – December 2025

- Implemented forward and inverse kinematics for an AUBO i5 robot using its URDF model, developed task-space motion planning algorithms and Jacobian-based velocity control for smooth and constrained end-effector trajectories
- Performed Monte Carlo simulations to estimate the robot workspace and analyze kinematic singularities
- Designed and simulated time-parameterized joint and Cartesian trajectories to evaluate motion feasibility and stability

Autonomous UAV Navigation & SLAM | *Python, ROS, Control Theory, LiDAR* — September 2025 – November 2025

- Engineered a lightweight SLAM pipeline for a resource-constrained UAV, fusing IMU data with sparse range measurements from a four-point LiDAR to build a real-time obstacle map
- Benchmarked A*, D*, and D* Lite planners via runtime logs, selecting D* Lite to achieve a 20% reduction in path re-planning time compared to standard A* implementations in dynamic environments.
- Implemented Minimum Snap trajectory generation using 7th-degree polynomials to feed smooth setpoints into a cascaded controller for precise attitude and velocity stabilization

Leadership & Involvement

Event Coordinator, SBUHacks 2024 | *Stony Brook University* — January 2023 – May 2024

- Managed logistics and sponsor outreach for 350+ attendee hackathon; ensured smooth event execution

Skills

Programming: Python, C++, Java, SQL, MATLAB, TCP/IP, UART, I2C
Tools & Skills: SolidWorks, NX, AutoCAD, Cura, LabVIEW, Epilog Laser, Bash, Git, Linux, Docker
Robotics & Simulation: ROS/ROS2, Motion Planning, URDF, RViz, Robotics Theory, Flight Dynamics, UAV Control, SLAM
Controls: Cascaded Control, Sensor Fusion, Control Theory, Kalman Filters, System Identification
Data & ML: Pandas, NumPy, Matplotlib, OpenCV, scikit-learn, PyTorch
Awards & Certificates: NYS EIT, Dean's List – Stony Brook University, Student Choice Award – Stony Brook CEAS, 2025
Languages: English, Chinese