Yuchen Wu

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EDUCATION

Carnegie Mellon University Expected graduation: **May 2025**
Master of Science in Mechanical Engineering-Research Pittsburgh, PA
Coursework: [Math Foundations in Robotics; Computer Vision; Provably Safe Robotics; Multivariate Linear Control]

University of Michigan May 2020 - May 2023
Bachelor of Science in Engineering in Computer Engineering, GPA: 3.86/4.0 Ann Arbor, MI
Coursework: [Algorithmic Robotics, Deep Learning for Computer Vision, Embedded Control Systems]

RESEARCH PROJECTS

Aerosol Jet Conformal Circuit Printing Project (supervised by Prof. Howie Choset) May 2023 – Present
Student Project Lead (3D Object Registration, System Integration, Path Planning, C++) CMU Biorobotics Lab
• Proposing a C++ in-situ *3D object registration* pipeline to perform 3D surface reconstruction and part coordinate system calibration.
• Integrating *IDS Nanojet* printhead to *UR5e robot arms* and achieving adaptive *conformal printing* on a 3D substrate.

Boeing Robotic Inkjet Printing Project (supervised by Prof. Howie Choset) October 2022 – Present
Research Assistant (State Estimation, Vibration Modeling, CoppeliaSim (V-rep), Python) CMU Biorobotics Lab
• Designing a sensor fusion algorithm to estimate real-time, sub-millimeter-level precision robot poses from *IMU* and *Vicon* MoCap.
• Performing frequency domain analysis and developing a vibration model for a large, flexible robot manipulator.
• Implementing a 1000-nozzle count, photorealistic inkjet printing simulation in *CoppeliaSim* (V-Rep).

Additive Manufacturing Defect Repair Project (supervised by Prof. Howie Choset) January 2022 – January 2023
Student Researcher (3D Vision, Software-Hardware Integration, ROS, C++) CMU Biorobotics Lab
• Implemented defect detection software that utilized a *3D vision sensor* and compared scanned objects against target geometry.
• Reduced 3D printed part defect volume from 10.7% to 1.3 % and improved geometric error from 3.86% to 0.08%.
• **IROS Best Paper Award**: Toward Closed-loop Additive Manufacturing: Paradigm Shift in Fabrication, Inspection, and Repair.

Indoor Autonomous Obstacle Avoidance Robot (supervised by Prof. Kira Barton) January 2021 - December 2021
Undergraduate Researcher (Path Planning, ROS, Python, Gazebo) Barton Research Group
• Implemented a dynamic *A* path planner* in Python to actively analyze *LiDAR* scans and achieve unknown *obstacle avoidance*.
• Simulated running of Toyota Human Support Robot in *ROS Gazebo* to validate dynamic path planner.

WORK EXPERIENCE

University of Michigan September 2022 - May 2023
Teaching Assistant (Embedded System Control, MATLAB Simulink) Ann Arbor, MI
• Taught concepts such as PID control theory and real-time computation using MATLAB Simulink and STM32 Boards.
• Led two 3-hour lab sections comprised of 20 students and hosted 4 hours of office hours weekly for 40+ students.

Shanghai Rumo Technology Co., Ltd June 2020-August 2020
Software Engineer Intern (Embedded System) Shanghai, China
• Designed an STM32 library to enable the Alibaba Cloud platform and Arduino board communication via *Ethernet* cable.
• Programmed Arduinos to communicate with industrial sensors, such as CO_2 sensors, using *RS-485* and I^2C protocols.

DJI Technology Co., Ltd January 2019 - February 2019
Robot Development Intern (Path Planning, Embedded System) Shenzhen, China
• Programmed a prototype robot to navigate out of a maze using *IR sensors*, *RFID beacons*, and breadth-first search algorithms.
• Tested performances of DJI Manifold2 onboard computer by decoding QR codes and performing other robot tasks.

SKILLS

Programming Skills: C++, Python, ROS, Embedded C, MATLAB, Java, LaTex
Hardware Design Skills: SolidWorks, Onshape, STM32 embedded system design, FPGA Design