Yuemin Mao

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EDUCATION

Carnegie Mellon University Pittsburgh, PA
Bachelor of Science in Mechanical Engineering & Additional Major in Robotics August 2019 - May 2023
- GPA: 3.97/4.0 | Dean's List: 7 semesters
- Tau Beta Pi Engineering Honor Society Member

PUBLICATIONS

- A. Gupta*, **Y. Mao***, A. Bhatia*, J. King, Y. Hou, X. Cheng, M. T. Mason. (*Co-first authors.) "Extrinsic Dexterous Manipulation with a Direct-drive Hand: A Case Study." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.* (Presented)

- E. Huang, X. Cheng, **Y. Mao**, A. Gupta, M. T. Mason. "Autogenerated Manipulation Primitives." *The International Journal of Robotics Research (IJRR), 2023.* (Accepted)

RESEARCH EXPERIENCE

Atkeson Laboratory Carnegie Mellon University
Undergraduate Research Assistant | Advisor: Christopher G. Atkeson September 2022 - May 2023
- Developing strategies for a Baxter robot to open cabinets by recognizing handles and hinges, based on active articulation model estimation through interactive perception.

The Manipulation Lab (MLab) Carnegie Mellon University
Undergraduate Research Assistant | Advisor: Matthew T. Mason May 2021 - May 2022
- Designed and implemented primitives for a direct-drive robot hand with an impedance control to execute pose transitions on small non-prehensile components with robustness and simplicity, applying the theory of "extrinsic dexterity."
- Constructed behavior sequences for a system including an ABB IRB120 manipulator, a direct-drive hand, and a vision subsystem to complete pre-assembly manipulation on small rubber components with high accuracy and efficiency.

Computational Engineering and Robotics Lab (CERLAB) Carnegie Mellon University
Undergraduate Research Assistant | Advisor: Kenji Shimada February 2021 - June 2021
- Upgraded the mechanical structure of a wall crawling robot designed for steel structure inspection, allowing modular control for the robot's three body sections.
- Redesigned a steel test rig to better simulate transitions between surfaces inside a ship, performed test drives to improve the robot's maneuverability.

PROJECTS

Pothole Filling Robot (PotBot), Robotics Capstone Project September 2022 - May 2023
- Prototyping an autonomous mobile robot which detects, fills, and flattens potholes, in order to decrease the time and expense for the operating process.

LQR Controller Based Firmware for Crazyflie 2.1 June 2022 - August 2022
- Designed a firmware for Crazyflie 2.1 based on LQR optimal control, adaptable to autonomous flight and remote control. Modified the built-in controllers of Crazyflie 2.1 to be compatible with the new firmware.

Obstacle Avoidance Mobile Robot March 2022 - May 2022
- Implemented obstacle avoidance algorithms on an ELEGOO Tumbller self-balancing robot that enables it to travel safely from its starting point to a required goal. Optimized its turning accuracy with a PID controller.

Human-drone Interaction (HDI) Exploration Study January 2022 - May 2022
- Conducted a Wizard-of-Oz elicitation study to generate models for users' natural body gestures during interaction with drones, giving insights for the design of HDI techniques.

Aero Composites, Carnegie Mellon Racing September 2019 - May 2021
- Optimized the airfoil design of a Formula SAE race car by analyzing its aerodynamic properties. Simulated manufacturing operations for the diffusers and airfoils and manually fabricated them with carbon fiber.

Teaching Experience

Teaching Assistant, CMU Department of Mechanical Engineering September 2021 - Present
Hold office hours, grade homework and exams for the following courses:

- 24-202: Introduction to Computer Aided Design (Fall 2021)
- 24-352: Dynamic Systems and Controls (Fall 2022)

Technical Skills

Programming: Python, C++, C, MATLAB, Julia
Robotics: ROS, Arduino, Raspberry Pi
Engineering: SolidWorks, Ansys Workbench, AutoCAD
Machines: 3D Printer, Laser Cutter, Mill, Lathe