

Ruiyang "Lucas" Zhou

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Education

Carnegie Mellon University, Pittsburgh, PA **Sep 2024 - May 2026**

Master of Science in Mechanical Engineering (MSME-R)

- Relevant Coursework: Mechanical Computation, Electromechanical System Design, Robot Dynamics and Analysis, Multivariable Linear Control, Optimal Control & Reinforcement Learning
- Research Area: Vehicle Automation and Reinforcement Learning

Rensselaer Polytechnic Institute, Troy, NY **Sep 2020 - May 2024**

B.Sc. in Mechanical Engineering, Minor: Economics

- Relevant Coursework: Modern Control Theory, Intro to Robotics, Fluid Mechanics, Linear Algebra, Thermodynamics, Heat Transfer

Experience

CerLab (RoboConstruction Group) - Carnegie Mellon University **Sep 2024 – Present**

Researcher, Advisor: Prof. Kenji Shimada, PhD Yuhei Sugano

Research Topic: Reinforcement Learning in Optimistic Wheel Loader Bucket Motion

- Designed and implemented reinforcement learning (RL) algorithms to optimize bucket motion in autonomous wheel loaders.
- Simulated and analyzed motion efficiency using Isaac Sim and Python, improving computational efficiency by **5%**.
- Collaborated with interdisciplinary teams to develop robotic control strategies for real-world construction applications.

NASA Fluid Mechanics Research - Rensselaer Polytechnic Institute **May 2023 - May 2024**

Student Researcher, Advisor: Prof. Amir Hirsra

- Designed and built precision mechanical systems to support micro-scale experiments investigating surface tension of water on different materials.
- Developed adjustable platforms and fluid control mechanisms to manipulate droplet formation and positioning under controlled conditions.
- Collaborated with experimental researchers to integrate optical imaging systems and minimize external vibrations, ensuring reliable micro-scale observations.
- Modeled fluid behavior and mechanical interactions in MATLAB to guide design iterations and improve experimental accuracy.

Automatic Potting Irrigation System (Capstone Project) **Jan 2021 - May 2022**

Team Leader & Spray Subsystem Designer

- Led a team of 4 engineers to develop an automated irrigation system for potted plants, reducing water usage by **5%**.
- Designed and prototyped a sprinkling system with semi-customized irrigation functions, integrating sensor-based automation.

Shanghai Zhenhua Port Machinery Co. **Feb 2023 - May 2023**

Mechanical Engineering Intern – 2D & 3D Engineering Design

- Created **2** customized engineering drawings with AutoCAD for complex machinery structures.
- Evaluated structural integrity and mechanical feasibility of components, optimizing material usage and cost.

Activities

Drone Society, Core Member **Sep 2022 - Present**

- Built and flew drones; won third prize in a club competition.

Robotics Club, Robot Builder & Data Analyst **Sep 2017 - Dec 2019**

- Designed and built robots; won Second Prize in VEX and FIRST Robotics.

Skills

Programming: Python, MATLAB, Isaac Sim, AutoCAD, MS Office

Engineering: Robotic Automation, Reinforcement Learning, mechanical design

Languages: Mandarin (native), English (fluent), Dutch (beginner)