Ruoxiang ZHAO

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EDUCATION

Rensselaer Polytechnic Institute (RPI) Sep 2022 - May 2026 (Expected)
Bachelor of Science in Mechanical Engineering Troy, NY
GPA: 3.87/4; **Honors:** Dean's Honor List (Fall 2022 - Fall 2024; 6 semesters)
Relevant Coursework: Finite Element Methods, Modeling & Control of Dynamic Systems, Mechatronics, etc.

EXPERIENCE

Undergraduate Researcher, **XAL Research Lab - RPI Research Team** Feb 2025 - Present
- Design a self-driving Can-Am X3 with a focus on achieving stable control under slipping conditions
- Develop autonomous braking, steering, and sensors for the car
- Utilize MATLAB and Simulink to model, simulate, and optimize control strategies
- Design custom mechanical components for autonomous systems using CAD software and 3D printing
- Design vehicle dynamics, control algorithms, and AI-based navigation systems

Engineering Department Intern, **Tesla** Jul 2025 - Aug 2025
- Reverse-engineered the Tesla Model 3 battery pack coolant distribution manifold to analyze its manufacturing process and potential failure modes, and deliver an optimization assessment report
- Created original and refined 3D CAD models of the coolant manifold for enhanced thermal dissipation efficiency, and produced design documentation and renderings
- Conducted a simulation analysis on the improved coolant manifold and drafted a report based on which to assess thermal performance
- Designed an integrated mounting bracket and cover for Tesla's autonomous driving sensors, with a major focus on manufacturability and assembly efficiency

PROJECTS

4DOF Robotic Arm Jan 2024 - Present
Course Project for Introduction to RCOS
- Created the CAD design, sourced materials, 3D printed components, and assembled the arm
- Engineered the system for future integration with AI-based cameras for object detection and manipulation
- Integrated the completed robotic arm onto the IED Leaf Vacuum robot platform

Leaf Vacuum Robot Jan 2024 - Dec 2024
Course Project for Introduction to Engineering Design (IED)
- Contributed to a team of six on an award-winning project recognized as the Best IED Project in two years
- Developed a 3D-printed leaf vacuum robot featuring a tracked chassis with two motors and a vacuum system controlled by an Arduino
- Conducted the CAD modeling process using Siemens NX and utilized 3D printing for prototyping

3D Printer Build & Customization Sep 2023 - Present
Personal Project
- Self-assembled two Voron 3D printers, achieving high-speed, high-quality printing performance
- Customized G-Code and upgraded a Voron 2.4 with a carbon fiber gantry and metal components to optimize precision and input shaping
- Introduced CAD to design and model custom parts for the printers, including camera and LED mounts

Vehicle Restoration and Modification May 2021 - Present
Personal Project
- Conducted a full overhaul of a 1993 Mazda MX-5, which included disassembling the vehicle, cleaning and refining all parts, repairing the chassis, and preparing for new paint
- Modified a 2013 Subaru BRZ and 2017 Honda Civic Type-R to enhance performance and appearance, and restored a 1995 Mercedes S500 W140 with a focus on mechanical repairs and aesthetic improvements

LEADERSHIP & ACTIVITIES

Rensselaer Motorsport (Formula SAE Team) Sep 2022 - Dec 2025
Team Member
- Designed CAD files for wheel hubs for the team's Formula SAE race car
- Contribute to the design and development of an actuator system focused on battery cooling

Rensselaer Student Auto Shop (RSAS) Sep 2022 - Present
Shop Manager
- Manage weekly operations of a student-run auto shop
- Provide hands-on technical support, assisting students with vehicle maintenance, modification, and repair

SKILLS

Computing: NX, SOLIDWORKS, FEA, MATLAB, Simulink, Python, NumPy, Java, JavaScript, Arduino, etc.
Fabrication: 3D Printing, CNC Machining, Mill, Lathe, Welding, etc.