# Qizhao Chen

655 Newell, Palo Alto, CA, 94303 | (408)-338-7241 | qizhaoc@ucla.edu

## EDUCATION

The Henry Samueli School of Engineering, **University of California, Los Angeles** 09/2024 - Present

- **Doctor of Philosophy in Mechanical Engineering** **Cumulative GPA**: **3.96**/4.0

Department of Mechanical Engineering**, Carnegie Mellon University** 08/2022 - 05/2024

- **Master of Science in Mechanical Engineering** **Cumulative GPA**: **3.96**/4.0

The Henry Samueli School of Engineering, **University of California, Irvine** 09/2018 - 06/2022

- **Bachelor of Science in Mechanical Engineering** **Cumulative GPA: 3.89/4.0**
- Minor: Film and Media Studies, GPA3.91/4.0;
- Honor: Graduate with Magna Cum Laude Honor; Dean's Honor List in 2022 Spring & Winter, 2021 Fall, Spring & Winter, 2020 Fall, Spring & Winter, and 2019 Spring & Winter

## PUBLICATION

- **Qizhao Chen**, Ziqi Hu, Dongwei Bai, Junyi Geng, and Sebastian Scherer. **A Unified MPC Strategy for a Tilt-rotor VTOL UAV Towards Seamless Mode Transitioning**. *AIAA SciTech 2024*

## RESEARCH EXPERIENCE

**PRACTICE Lab***, University of California, Los Angeles* 09/2024 - Present

*Graduate Researcher* Supervisor: **Prof. Anushri Dixit**

Project: Safe Navigation with VLMs and Conformal Prediction

- Designed a tree-style exploration goal-finding framework for embodied agents that integrates visual-language model (VLM) reasoning navigating in unseen environment
- Developed a conformal prediction-based mechanism to provide statistical guarantees for visual-language-based decision making under uncertainty
- Implemented a ROS 2–based real-world deployment on MentorPi robots, validating VLM-driven navigation under uncertainty

**AirLab**, *Robotics Institute, Carnegie Mellon University* 09/2022 – 05/2024

*Graduate Researcher* Supervisor: **Prof. Sebastian Scherer** & **Prof. Junyi Geng**

Project: Tilt-rotor eVTOL

- Designed and modeled a tilt-rotor eVTOL with four individual tilt rotors capable of vertical take-off and landing and simulated all behaviors in Gazebo and customized MATLAB simulation
- Developed a Model Predictive Control (MPC)-based control strategy and solver based control allocation strategies for unified control and seamless mode transitioning of the eVTOL
- Analyzed VTOL aerodynamic behavior and explored possible solutions for VTOL mode transition considering controller blending, aerodynamic changes, and control allocation adaptation

**Prof. Natascha Buswell's Research Group**, *University of California, Irvine* 03/2022 - 09/2022

*Student Researcher* Supervisor: **Prof. Natascha Buswel**l

Project: Analysis of New Professors' Preparedness to Teaching

- Investigated the potential reasons that cause unpreparedness of new professors in mechanical engineering
- Analyzed 12 interview transcripts using ATLAS.ti to find the causes

**Electroactive Materials Characterization Lab**, *Pennsylvania State University* 06/2021 - 08/2021

*Research Intern* Supervisor: **Prof. Zoubeida Ounaie** & **Prof. Amrita Basak**

Biopolymer and Ceramic 3D Printer

- Researched the impact of nozzle speed, nozzle height, and extrusion speed on biopolymer 3D printing
- Studied the characteristics of barium titanate and developed a ceramic-compatible 3D printer design
- Worked out possible solutions to material leakages such as using rubber sealing and changing to a one-part design

## NOTABLE ACADEMIC PROJECT

**Medical Injection Robot**, *University of California, Los Angeles* 04/2025 – 06/2025

*Main Contributor* Supervisor: **Prof. Veronica Santos**

- Designed a robotic arm system for precise and safe skin injection, focusing on mechanical safety and user-centered design
- Developed a centralized impedance controller for robot arm injection control
- Verified the injection process in custom-built MATLAB simulation for various skin stiffness and penetration depths

**F1Tenth Autonomous Racing**, *Carnegie Mellon University* 08/2023 – 12/2023

*Main Contributor* Supervisor: **Prof. John M. Dolan**

- Created different autonomous driving algorithms for a 1-10 scale fast-driving RC car using ROS2 platform, both in simulation and real vehicle
- Developed a dynamic emergency object avoidance algorithm capable of making timely adjustments for the high-speed vehicle
- Created a pure-pursuit algorithm for accurate trajectory following and map visualization

**Stairs-cleaning Robot**, *Carnegie Mellon University* 01/2023 - 06/2023

*Main Contributor* Supervisor: **Prof. Zeynep Temel** & **Prof. Cameron Riviere**

- Engineered and fabricated an innovative autonomous robot capable of stair climbing and cleaning, which outperformed similar robots in previous years in terms of overall task success rate
- Performed an in-depth study using ROS to control the interactions of sensors and actuators
- Participated a public presentation including all members at CMU Tech Spark and several industrial robot companies

**Robot Control Optimization**, *Carnegie Mellon University* 01/2023 - 06/2023

*Main Contributor* Supervisor: **Prof. Zac Manchester**

- Provided a solution to a Time-Optimal Trajectory Planning (TOTP) problem on an industrial robot arm by switching constraints domain
- Proposed a solution that can be solved at real-time by splitting the problem into several computation cycles
- Developed a control strategy using domain mapping that satisfies third-order as well as other constraints

**Self-autonomous Boat**, *University of California, Irvine* 12/2021 - 03/2022

*Main Contributor* Supervisor: **Prof. Camilo Velez Cuervo**

- Designed and manufactured a boat that can self-navigate to designated temperature and sound sources
- Studied robot state machines based on different mechanical and electrical designs
- Won the best mechanical design award in the final competition

**Intelligent Ground Vehicle**, *University of California, Irvine* 09/2020 - 03/2022

*Mechanical Team Lead and Electrical Team Member* Supervisor: **Prof. David Copp**

- Designed and manufactured an unmanned vehicle that could avoid obstacles and correct directions automatically
- Led the mechanical team to design the chassis of the vehicle considering multiple design choices
- Simulated the feasibility of the circuit using MATLAB and simulated the movements of the vehicle using SolidWorks

## ADDITIONAL EXPERIENCE

**Teaching Assistant,** *University of California, Los Angeles* 01/2026 – Present

*Teaching Assistant for* Prof. Anushri Dixit

- Participated in teaching MAE171A (Introduction to Feedback and Control Systems)

**Mechanics of Structures Teaching Team,** *University of California, Irvine* 09/2021 – 12/2021

*Learning Assistant for* Prof. Natascha Buswell

- Participated in teaching MAE150 and MAE150L (Mechanics of Structures)

## SKILLS

**Programming Language**: Python, ROS1, ROS2, C++, MATLAB, Julia, Arduino, G-code

**Specific Software Proficiency:** Proficient in SolidWorks, TinkerCAD, and ATLAS.ti