Zilin Chen

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EDUCATION

School of Mechanical Engineering, Tsinghua University, Beijing, China Aug 2022–present
B.E. in Mechanical Engineering
Current overall GPA: 3.59/4.0 (Top 35%)
English Proficiency: IELTS Overall 7.5 (Reading 8.5, Listening 8.5, Speaking 6.0, Writing 6.5)
Core Courses:

- Mechatronic System Design Practice (A)
- Mechanical Engineering Mechanics (1) (A+)
- Robot Cognition and Practice (A-)

Department of Mechanical and Industrial Engineering, University of Toronto Sep 2024–Dec 2024
Exchange student in Mechanical Engineering
Major courses GPA for this semester: 3.9/4.0
Courses:

- Kinematics and Dynamics of Machines (A-)
- Fluid Mechanics I (A)
- Circuits with Applications to Mechanical Engineering Systems (A+)

PROJECTS

Artificial Muscle-Actuated UAV—Research Assistant Feb 2025–Present
Advisor: Dr.Huichan Zhao, Associate Professor, School of Mechanical Engineering, Tsinghua University

· Designed and built a cross-platform simulation framework for a new class of UAV using artificial muscles; written entirely in C++ with Python-based visualization
· Created a lightweight **flight control system** for a 23g muscle-actuated drone on my own, enabling stable flight and responsive control
· Leave the **framework code** for building the simulator for the laboratory

UTAT Autonomous Drone Racing Team—Research Assistant Sep 2024–Jan 2025
Advisor: Dr.Hugh H.T. Liu, Director, Centre for Aerial Robotics Research and Education, University of Toronto

· Assisted in experimental testing of ESC switching frequency and motor response curve to improve simulation accuracy, with the error **within 5%** after interpolation
· **Developed a custom racing drone simulator**, focusing on flight controller logic, by adapting open-source components (read all the code of betaflight) for compatibility with onboard computing
· Use CasADi to develop and optimize yaw axis trajectories to solve the **time-optimal path**, thereby improving gate visibility and navigation accuracy, and increasing the speed of the drone by **more than 50%**

Intelligent Vehicle Design—Team Leader June 2024–August 2024

· Led a team of three to design and construct an autonomous, car-shaped vehicle capable of object transport over predefined routes
· Integrated multiple advanced features including **line-following, real-time obstacle avoidance, target detection**, and Bluetooth-based remote control
· Implemented PID control algorithms to finely tune motor parameters for precise control of velocity and turning angle
· Utilized STM32 microcontroller for embedded control, and OpenMV for **real-time computer vision**, image recognition, and dynamic path planning

Collaborative Robot Design—Research Assistant Feb 2024–Dec 2024

Advisor: Dr.Ze Wang, Assistant Dean, School of Mechanical Engineering, Tsinghua University

- Conducted an in-depth literature review and compiled a report on motion trajectory planning strategies for dual-arm collaborative robots
- Proposed and implemented methods to enhance the end-effector stability under dynamic and cooperative motions
- **Analyzed and simulated the workspace and joint constraints** to avoid internal collisions between the two robotic arms
- Collaborated with a team of four to conceptualize and evaluate multiple robot configurations to improve system stiffness and operational reliability

INTERNSHIP EXPERIENCE

Humaniod robot arm path planning and control HIL test Jul 2025–Present

Xiaomi Corporation, Mechanical Engineering Engineer

- Participated in the assembly and debugging of humanoid robotic arms deployed in automotive production lines
- Executed **Hardware-in-the-Loop (HIL)** simulations to validate robotic control systems in real-time environments
- Developed and tested control algorithms for 7–DOF arm motion planning and execution, helping the developing team to finish the ***ISO 9283:1998*** **test**

Chemical Mechanical Polishing Edge Polishing Simulation Jun 2025–Jul 2025

Huahaiqingke Corporation, Mechanical Engineer

- Built a comprehensive **kinematic simulation model** to study the CMP edge-finishing process
- Optimized the leveling process through mechanical adjustments, significantly improving the leveling speed and stability (the leveling process took about **60 minutes before** optimization and about **10 minutes after** optimization)
- Analyzed the impact of key process parameters on surface quality and edge integrity, contributing to refinement of operation protocols

LEADERSHIP AND ACTIVITIES

Tsinghua University Symphony Orchestra Aug 2023—July 2024

Vice President, CCYL Tsinghua University Committee

- Coordinated logistics and scheduling for the orchestra's performance in the 7^{th} National College Student Art Exhibition, where the group secured the **top national award**
- Oversaw rehearsal planning and internal affairs; organized multiple high-attendance concerts involving over 30 performers
- Served as both the **principal bassist and pianist**, contributing musically and administratively to the orchestra's success

SKILLS AND INTERESTS

Research Interests	Autonomous control systems, optimal trajectory planning, robotic dynamics
Practical Skills	Skilled in metalworking, machining, conducting industrial robot experiments
Programming Languages	Proficient in C, C++, Python, MATLAB; familiar with Java
Software Proficiency	AutoCAD, SolidWorks, Multisim, Adobe Photoshop

SELECTED AWARDS

Literary and Art Scholarship *2023 & 2024*

Best social practice team Leader *Spring 2024*