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 until junior: 3.59/4.0 (Top 35%)
Core Courses:

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

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

Intelligent Vehicle Design - Team Leader July 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

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 frequencies and motor response curves to support simulation accuracy
· **Developed a custom racing drone simulator**, focusing on flight controller logic, by adapting open-source components for compatibility with onboard computing
· **Formulated and optimized yaw-axis trajectories** under race constraints using CasADi to solve for time-optimal paths, enhancing drone gate visibility and navigation accuracy

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, enabling stable flight and responsive control

INTERNSHIP EXPERIENCE

Huahaiqingke CMP Edge Polishing - Mechanical Engineering Intern Jun 2025 - Jul 2025

- Built a comprehensive **kinematic simulation model** to study the chemical mechanical polishing (CMP) edge-finishing process
- Optimized the leveling workflow through mechanical adjustments, significantly increasing throughput and stability
- Analyzed the impact of key process parameters on surface quality and edge integrity, contributing to refinement of operation protocols

Xiaomi Corporation - Mechanical Engineering Intern Jul 2025 - Present

- 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 high-degree-of-freedom arm motion planning and execution

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

Student Social Practice Team Jan 2024 - Mar 2024

Project Leader, CCYL Mechanical Engineering Committee

- Organized and led a 16-member interdisciplinary team, including members from HUST and TJU, for a national-level social practice project
- Visited leading mechanical enterprises to conduct field research and held dialogues with frontline engineers about real-world applications and engineering challenges
- Honored with the Golden Award for Social Practice within the Department, and received the individual Best Team Leader award for outstanding leadership and organization

SKILLS AND INTERESTS

English Proficiency	IELTS Overall: 7.5 (Reading 8.5, Listening 8.5, Speaking 6.0, Writing 6.5)
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	Microsoft Office Suite, Adobe Photoshop, AutoCAD, SolidWorks, Multisim

SELECTED AWARDS

Literary and Art Scholarship *2023*
Literary and Art Scholarship *2024*
Best social practice team Leader *Spring 2024*