# CHEN Ziyu

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## EDUCATION

**Shanghai Normal University**                                      Shanghai, China
Bachelor Degree, Major in Mechanical Design, Manufacturing and Automation       09/2020-06/2024
- GPA: 3.59/4.00; 89.75/100
- Class Rank: 1/30
- Major Rank: 2/76

**The University of Hong Kong**                               HongKong SAR, China
Master of Science in Engineering, Major in Mechanical Engineering       09/2024-Present

## PUBLICATIONS

**Title:** "Dynamic Optimization of Mechanism Parameters of Bipedal Robot Considering Full-Range Walking Energy Efficiency"
**Status:** Published in Appl. Sci. 2023, 13(19), 10791
**Role:** First Author
**DOI:** https://doi.org/10.3390/app131910791

**Title:** "Appending Propellers to Leg for Enhancing Robustness of Hopping Locomotion"
**Status:** Under review in CLAWAR 2025
**Role:** Second Author

**Title:** "Bionic Mechanism and Adaptive Control Pattern of Bipedal Robot Walking on Slopes Based on Zero-Point Slope"
**Status:** Under review in Robotics and Autonomous Systems
**Role:** Second Author

**Title:** "Lattice-Hopping: A Novel Map Representation Based Path Planning Algorithm for High-Density Storage System"
**Status:** Under review in Machines
**Role:** Third Author

## PATENTS

**Patent for Utility Model:** Double Arm Robot
**Role:** First Inventor

- Developed a dual arm robot with a single MCU control system.
- Enabled human-like arm movements and synchronized control for improved efficiency.
- Versatile applications across industrial production, hazard handling, national defense, and aerospace.

# RESEARCH PROJECTS

**A Minimalistic 3D Hopping Robot with Parallel 3-RSR Mechanism**                 11/2024 - Present

- Contributed to the design of the control system for a minimalist 3D hopping robot, focusing on ensuring stability during hopping maneuvers.
- Engaged in hands-on testing and refinement of control algorithms to enhance robot dynamics and performance in challenging environments.
- Participated in the development of the robot's hardware system, including the selection and integration of components to ensure the system's stability and functionality.

**Biped Robots for Artificial Intelligence Education**                 12/2021 - 09/2024

- Led research for project: focused on mechanical structure design (four-link mechanism), humanoid robot controller system, and bipedal robot gait planning (ZMP and MPC control).
- Designed the configuration of a bipedal robot based on a four-bar linkage mechanism to elevate the knee joint, enhancing the overall humanoid characteristics of the robot.
- Conducted research on the controller system of educational humanoid robots, including investigating the main control system of Jetson nano, developing a robot motion control system based on ESP32, and designing foot sensors based on multi-point pressure.
- Implemented gait planning using intelligent control algorithms, employing ZMP and MPC algorithms to ensure stable gait and optimize the trajectory of bipedal robots.

**Contactless Epidemic-Focused Delivery Robot with SLAM Autonomous Navigation**
11/2022 - 09/2024

- Led research on autonomous navigation and positioning of contactless delivery robots based on SLAM, achieving higher accuracy by integrating IMU and camera data.
- Designed and executed path planning and obstacle avoidance for contactless delivery robots, utilizing geometric methods to create environment maps and optimizing path planning with graph search algorithms.
- Created a full control and guidance system for contactless delivery robots, featuring a user-friendly speech recognition component.

**Creating a 6-DOF Servo Robot Arm for Engineering Education**                 09/2022 - 09/2024

- Led the design and implementation of a six-degree-of-freedom servo robotic arm for engineering literacy education (provincial-level).
- Conducted configuration and performance analysis of the robotic arm, utilizing the small elephant robotic arm as a reference, to create an educational tool tailored to teaching scenarios.

- Utilized Adina for mechanical analysis, performing static structural analysis to ensure the robotic arm's structural integrity and dynamic performance.
- Managed the physical assembly of the robotic arm, overseeing servo control through the upper computer and assembly and testing of the 3D printed physical prototype.

## PROFESSIONAL EXPERIENCE

**Research Assistant, Jiaxing Chuangjie Intelligent Technology Co., Ltd.**          01/2021 - 05/2024

- Assist in writing two utility model patents, a robot dual arm structure and robot, a dual arm robot.
- Assisted in the design of multiple commercial project institutions: production type TS-R450-v7.0 mobile robot, AGV charging car, visual inspection equipment cabinet, six axis mechanical arm, football robot, electric push rod.
- Successfully sold the football robot to sports schools like Shanghai Institute of Sports, realizing commercial value.

**Engineering Intern, Changzhou ANT Machinery Technology Co., Ltd**          07/2023 - 10/2023

- Responsible for providing technical support to the technical department, drawing and making physical objects, and contacting the factory.
- Participate in research and development projects, collaborate with engineering teams, and assist them in designing, developing, and testing various functions and performance of robotic arms.

**Research Assistant, The Chinese University of Hong Kong**          11/2024 - Present

- Contributed to the control and simulation of a minimalist 3D hopping robot, focusing on optimizing control algorithms and conducting simulations to enhance robot performance.
- Authored a research paper detailing the design, control strategies, and simulation results of the 3D hopping robot.
- Participated in the development of the robot's hardware system, including the selection and integration of components, ensuring the system's stability and functionality.

**Research Assistant, The University of Hong Kong**          11/2024 - 05/2025

- Contributed to the Development and Applications of Daily-use Fall Risk Assessment Device to Prevent Elderly People from Falling, specializing in data collection and analysis, including deploying and maintaining sensor systems for real-time data acquisition.
- Developed efficient workflows to process and validate large-scale engineering datasets, ensuring data accuracy and reliability for research and practical applications.
- Collaborated with engineers and researchers to troubleshoot field challenges, demonstrating strong problem-solving skills, such as optimizing data sampling protocols to improve measurement reliability.

- Utilized Python, MATLAB, and advanced lab equipment to bridge theoretical research with practical implementation, enhancing project outcomes.

## AWARDS & PRIZES

- Excellent graduate of ordinary colleges and universities in Shanghai
- Excellent student of Shanghai Normal University
- Professional Scholarship at Shanghai Normal University
- Excellent graduate from the experimental class of intelligent manufacturing innovative talents training in the School of Information and Electromechanical Engineering of Shanghai Normal University
- Excellent Intern of School of Information and Electromechanical Engineering, Shanghai Normal University
- Provincial Excellence Project in Shanghai College Student Innovation and Entrepreneurship Training Program - "Design of Bipedal Robot System for Artificial Intelligence Education", project leader
- Second Prize in the 8th "Huichuang Youth" Cultural and Creative Works Exhibition Activity for Shanghai University Students
- Excellence Award in 2022 Shanghai College Student "Creation Cup" Competition, project leader
- First Prize in the 7th National College Business English Competition
- Second Prize at the 13th National College Student E-commerce Challenge Competition for Innovation and Entrepreneurship, project leader
- Bronze Award in the Undergraduate Group at the 8th China International "Internet+" College Student Innovation and Entrepreneurship Competition - Shanghai Normal University Competition, project leader
- Bronze Award in the Graduate Group at the 8th China International "Internet+" College Student Innovation and Entrepreneurship Competition - Shanghai Normal University Competition, project leader
- Third Prize in the 4th "Yongda Cup" Intelligent Car Competition, project leader
- Third Prize in the 5th "Yongda Cup" Intelligent Car Competition, project leader

## LANGUAGES & IT SKILLS

- Chinese: Native Language, English: Fluent
- Proficient in Microsoft office, Python and SPSS, SolidWorks, AutoCAD, Matlab, Origin, Axglyph