

Zihan Wang

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Education

The Chinese University of Hong Kong

Aug. 2025 – Present

M.S. in Robotics

Beihang University

Sep. 2021 – Jun. 2025

B.E. in Automation

- GPA: 88.1/100

Publications and Manuscripts

PUB: A Plasma-Propelled Ultra-Quiet Blimp with Two-DOF Vector Thrusting.

Yixing Zhang, **Zihan Wang**, Zhijun Li, Xuanlin Fan, Jiawei Zhang, Shaoping Wang

arXiv, 2025 [\[pdf\]](#)

Plasma-propelled ultra-quiet flying robot system and power combination control method.

China Invention Patent CN118220461A [\[pdf\]](#)

Research Experience

Unmanned Systems Research Group, CUHK

Nov. 2025 – Present

Graduate Research Assistant

Advisor: [Prof. Ben M. Chen](#)

- Topic: BEV-Based Cross-Modal Perception

Legged Robot Lab, CUHK

Oct. 2025 – Present

Graduate Research Assistant

Advisor: [Prof. Yun-hui Liu](#)

- Topic: Vision-based Locomotion for Quadruped Robots

Tsinghua Laboratory of Brain and Intelligence, THU

Mar. 2025 – Jul. 2025

Undergraduate Research Assistant

Advisor: [Prof. Jia Liu](#)

- Topic: 2D&3D SLAM algorithms for [Zhixing Autonomous Car II](#)

Advanced Robotics Centre, NUS

Jul. 2023 – Dec. 2023

Undergraduate Research Assistant (Remote)

Advisor: [Dr. Wenshuo Wang](#)

- Topic: 6-DOF Grasp Based on Foundation Models

Industry Experience

Beijing Kaiyun Technology Co., Beijing

Jul. 2024 – Sep. 2024

Summer Intern

Advisor: [Bin Zhu](#)

- Designed scripted test programs with LUA on the Semi-Physical Simulation Test Software ETEST.
- Accomplished semi-physical simulation on an embedded system lab box to design a smart clock with temperature and humidity sensing capabilities.

Projects

[Wheel-Legged Robot](#)

May. 2025 - Jul. 2025

- Developed a wheeled-legged balancing robot, designing a custom STM32F103 microcontroller board and embedded software, with LQR and VMC-based control, capable of balancing, load-carrying and differential-drive locomotion.
- Implemented cascaded PID control loops to enhance MIT servo motor positioning accuracy to within $\pm 0.5^\circ$.
- Integrated the Mahony Filter for accurate state estimation from the Inertial Measurement Unit (IMU).

[Zhi Xing Autonomous Car II](#)

Mar. 2025 - May. 2025

- Developed a ROS2 autonomous mobile car based on NVIDIA Jetson, with sensor fusion implemented from the

driver level to integrate LiDAR and depth cameras, enabling real-time perception and navigation.

- **Modeling & Simulation:** Designed the URDF vehicle model and validated motion dynamics through IsaacSim and Gazebo for robust system testing.
- **High-Precision Mapping & Navigation:** Deployed Cartographer SLAM integrated with Nav2 navigation stack, achieving over 95% map coverage and robust obstacle-aware path planning.
- **3D Mapping:** Utilized Intel RealSense cameras with the NVBlox framework to generate real-time ESDF occupancy maps, enabling faster and more accurate navigation in dynamic environments.

High-Fidelity 3D Building Reconstruction from Point Clouds(Bachelor Thesis)

Dec. 2024 - Jun. 2025

- Developed a comprehensive pipeline for high-precision 3D reconstruction of ground buildings from handheld laser scanner data, focusing on refined modeling through advanced segmentation and geometric completion.
- **Data Preprocessing:** Established a robust preprocessing pipeline for large-scale raw SLAM data. Utilized Statistical Outlier Removal to effectively filter a 74 million point cloud, reducing its size by 8.6% to eliminate noise and outliers while preserving key structural integrity.
- **Semantic Segmentation:** Implemented and trained a PointNet++ based deep learning model for semantic segmentation of architectural components (e.g., walls, windows, doors). Achieved 83.6% overall accuracy (OA) and 54.0% mIoU on custom-scanned building data, enhancing model robustness in complex scenes with occlusions or irregular structures.
- **Refined Modeling via Component Regularization:** Designed a novel workflow to address data incompleteness and geometric inconsistencies. Using K-Means clustering to automatically classify and standardize building components based on their geometric properties (height, width).
- **Component Reuse and Completion:** Employed a two-stage registration process, combining manual point-pair matching for coarse alignment with the Iterative Closest Point (ICP) algorithm for fine-tuning, successfully completing missing or occluded architectural features with high precision.

Zhi Xing Autonomous Car I

Sep. 2024 - Nov. 2024

- Developed an autonomous mobile car using ROS, integrating mapping, navigation, and voice interaction modules for real-world deployment.
- **SLAM Mapping:** Implemented GMapping to generate 2D occupancy grid maps, achieving over 90% map coverage.
- **Path Planning & Obstacle Avoidance:** Deployed the ROS Navigation Package for real-time global and local planning, achieving dynamic obstacle avoidance with 97% avoidance accuracy.
- **Voice Interface:** Integrated the Baidu Speech Recognition SDK for hands-free voice-controlled navigation, with >80% recognition accuracy.

Treasure-Hunting Car

Feb. 2023 - May. 2023

- Developed a mobile robot using Arduino as the main controller and ESP32 for signal processing, integrating map recognition, path planning, and motion control capabilities.
- Developed map-based image processing pipeline using OpenCV, obtain the head-down map by using Perspective Transform on the slant front view and obstacle coordinate extraction through edge detection and contour analysis.
- Integrated PID control with the A* searching algorithm to achieve high-precision path tracking and dynamic obstacle avoidance. Attained sub-centimeter positional accuracy (<0.5 cm) and rapid attitude control response with minimal overshoot (<1%).

Skills

Programing: C/C++, Python, Pytorch, MATLAB

Frameworks: ROS/ROS2, OpenCV, PCL, IsaacSim/Lab, Gazebo, Mujoco

Hardware: Solidworks, Fusion360, 3D Printing; Multisim; STM32, ESP32, Arduino, NVIDIA Jetson

Robot: Unitree GO1/2

Language: TOEFL:101 (W:27), \LaTeX

Awards

The Undergraduate Training Program for Innovation and Entrepreneurship Funding (National level)	2024
Academic Excellence Award	2024
Academic Excellence Award	2023