

# Chengwei Zhang

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## RESEARCH INTERESTS

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**Robotic Navigation:** Efficient Path Planning and Decision Making, Learning-based Exploration, Visual SLAM.

**Autonomous Driving:** 3D Scene Reconstruction, Perception and Sensor Fusion.

## EDUCATION

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**Peking University**, Beijing, China

Sept 2021 - Present

Bachelor of Science in Robotics and Mechanics (Dual-degree)

Cumulative GPA: 3.79/4.00 Rank: 2/22

Expected Graduation: July 2025

## Publications

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- **DeSiRe-GS: 4D Street Gaussians for Static-Dynamic Decomposition and Surface Reconstruction for Urban Driving Scenes**, *Submitted to CVPR 2025, Co-first Author*

## RESEARCH EXPERIENCE

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### Efficient Active Visual SLAM Utilizing Terrain Information

Chang Liu's group, Autonomous Robots Lab, Peking University, China

July 2023 - September 2024

- Proposed a hierarchical active SLAM structure with a reinforcement-learning-based global goal planner and a supervised-learning-based local path planner.
- Designed a high-efficiency multi-resolution global map encoder for the global planner and a terrain-and-semantic-based local planner.
- Conducted on real-world dataset (Gibson Dataset) and showcased the proposed algorithm improved the model's training efficiency and sensitivity to terrain changes.

### Soft Robotics Motion Control and Reinforcement Learning

Ke Liu's group, Peking University, China

May 2024 - Present

- Developed and validated models of soft robots in the Mujoco simulation environment.
- Studied reinforcement learning principles and implemented reinforcement learning-based control for soft robotics using the SAC algorithm.

### 3D Gaussian Splatting for Dynamic Scene Reconstruction and Dynamic-Static Decomposition

(In collaboration with second-year PhD student Chengsheng Peng)

Masayoshi Tomizuka's group, Mechanical Systems Control Lab, UC Berkeley, the U.S.

July 2024 - November 2024

- Proposed DeSiRe-GS, a self-supervised gaussian splatting representation for effective static-dynamic decomposition and high-fidelity surface reconstruction, and tested the algorithms on Waymo Open Dataset.
- Developed a dynamic model based on dinov2 feature dissimilarity for dynamic-static decomposition.
- Designed a temporal geometric consistency loss to enforce consistent geometry reconstruction and worked extensively on surface reconstruction and visualization.

## LANGUAGE PROFICIENCY

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### TOEFL iBT: 107/120

Listening: 27 — Reading: 28 — Speaking: 26 — Writing: 26

## AWARDS

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- Boeing Scholarship (Third Prize), College of Engineering, Peking University 2022
- Merit Student of Peking University 2023
- China Optics Valley Scholarship 2023

## SKILLS

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- **Programming Languages:** C, C++, Python, Shell, MATLAB
- **Software and Tools:** Linux, PyTorch, ROS, LaTeX, Gazebo, Mujoco, SolidWorks