# Hanwen Zhang

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## Education

# • Sun Yat-Sen University

Working on a Master's Degree in Computer Technology Thesis: Real-Time Dense Mapping for Robots

## • Northeast Agricultural University

Bachelor of Engineering Grades Ranking: 2nd Thesis: Design of Multi-Target Weeding System based on Artificial Intelligence

### **Research Interests**

Mapping; SLAM; Multi-Sensor Fusion; Active Mapping; Aerial Systems

# Publications

• Rapid-Mapping: LiDAR-Visual Implicit Neural Representations for Real-Time Dense Mapping. Hanwen Zhang, Yujie Zou, Zhewen Yan, Hui Cheng. IEEE Robotics and Automation Letters, 2024.

The **first** real-time Lidar-Visual mapping method based on implicit neural representation is proposed, which possesses a high level of predictive capabilities, the ability to capture highly detailed maps, and real-time performance.

• H<sub>2</sub>-Mapping: Real-time Dense Mapping Using Hierarchical Hybrid Representation. Chenxing Jiang<sup>\*</sup>, Hanwen Zhang<sup>\*</sup>, Peize Liu, Zehuan Yu, Hui Cheng, Boyu Zhou, Shaojie Shen. IEEE Robotics and Automation Letters, 2023. (RAL 2023 Best Paper)

Co-first author. Orded Determined by coin flip.

Our method is the **first** to run a NeRF-based mapping method onboard for robots in real-time.

#### Working Papers

# • A Multi-Sensor Aerial Robots Dataset for Fine-Grained Reconstruction. Yujie Zou<sup>\*</sup>, Hanwen Zhang<sup>\*</sup>, Zhewen Yan, Hui Cheng. [In Progress]

In this work, I was mainly responsible for engineering tasks to compensate for my lack of experience in building SLAM/Mapping systems. My tasks included mounting LiDAR and cameras on the DJI M300, calibrating intrinsic and extrinsic, extracting and processing RTK data, and designing the time synchronization module.

• EDOS: Efficient UAV Exploration with Dense-aware Online Scanning Using a LiDAR Sensor. Zhewen Yan, Junlong Huang, Yujie Zou, **Hanwen Zhang**, Hui Cheng. [Under Review at RAL]

This work propose a framework that supports efficient UAV exploration with dense-aware online scanning using a LiDAR sensor. By collaborating on this project, I gained experience in active mapping, which is beneficial for realizing my ultimate research vision.

### Honours and Awards

• First Prize in the 13th China College Student Computer Design Competition, China, 2020

• Third Prize in the 16th "Challenge Cup" National College Student Extracurricular Academic Science and Technology Competition, China, 2019

• Second Prize in the First National College Student Intelligent Electromechanical Systems Innovation Design Competition, China, 2019

2022/09 - Present, China

2018/09 - 06/2022, China

# **Skills and Interests**

- Computer skills: Python; C++; ROS; PyTorch; Matlab; CUDA; OpenGL; ImGui
- Knowledge skills: Mapping; 3D Reconstruction; Robot State Estimation; Multi-Sensors Fusion; Computer Graphics; Theoretical Mechanics
- Engineering skills: CAD; Cero; Embedded Design;
- Language: English (Normal); Chinese (Native)
- Interests: Guitar; Swimming; Reading; Chinese Kongfu

### Supervisor

## Prof. Hui Cheng

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### Prof. Bouyu Zhou

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