

# Tingjun Huang

MSc student in Robotics, Systems and Control at ETH Zurich

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**Research interests:** Embodied AI, 3D computer vision, robot learning and manipulation, visual navigation.

## Education

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### ETH Zurich

*MSc in Robotics, Systems and Control*

Sep. 2025 - Present

### Southern University of Science and Technology (SUSTech)

*BEng in Information Engineering*

Aug. 2021 - Jul. 2025

GPA: 3.91/4.0; rank: 2/23.

## Research Experience

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### National University of Singapore

*Research Assistant / Artificial Intelligence Research Lab*

Jun. 2024 - Sep. 2024

Supervisor: Prof. Lin Shao

- Designed and implemented an autonomous social navigation agent using vision-language models for high-level task reasoning and policy planning in social environments.

## Selected Research and Projects

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### RIGOR: Rig-Informed Geometry for Omnidirectional Reconstruction

*3D reconstruction research project*

2026

- Developed a 3D reconstruction pipeline for 360-degree construction-site walkthroughs using a frozen feed-forward model and four-view virtual camera rigs.
- The pipeline combines virtual-rig checks for local pose correction, cyclic four-view retrieval and joint geometric verification for loop closure, and Sim(3) pose-graph optimization for point-cloud fusion.

### Dexterous Manipulation and PIP-DIP Coupling

*Real World Robotics coursework project, ETH Zurich*

Sep. 2025 - Dec. 2025

- Assembled an ORCA hand, trained and deployed a reinforcement learning policy for in-hand object reorientation, and implemented imitation learning for color-based sorting.
- Completed a team project on PIP-DIP joint coupling in the ORCA hand.

### Knowledge Distillation for Visual Place Recognition

*Individual research project*

Sep. 2023 - Nov. 2024

- Fine-tuned DINOv2 for visual place recognition and distilled its representations into a lightweight Mamba-based model for efficient mobile deployment.

## Selected Projects (continued)

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### Visual Teach-and-Repeat Navigation

*Core member*

Oct. 2023 - Sep. 2024

<https://github.com/Gralerfics/pf-drive>

- Co-developed a monocular visual teach-and-repeat navigation system for differential-drive and Ackermann-steering platforms in Gazebo and Webots.

### Category-Specific Object Grasping

*Robotic Motion and Control coursework project*

May 2024 - Jun. 2024

- Co-implemented a grasping system for the Kinova Gen3 Lite arm using GGCNN and YOLOv5 to grasp irregularly shaped objects from specified categories.

### Real-Time Augmented Reality

*Digital Image Processing coursework project*

Apr. 2024 - Jun. 2024

<https://github.com/TangentH/AR-Gallery>

- Built an AR application combining custom ArUco marker detection with Poisson blending for seamless image fusion.

## Additional Engineering Experience

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### SUSTech RoboMaster Team

*Hardware and Embedded Systems Engineer*

Sep. 2022 - Aug. 2023

- Designed custom PCBs and embedded code for mobile robots, including infrared power control and buck-boost converters; assembled and debugged components including RFID systems.

## Technical Skills

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**Programming:** Python, C/C++, MATLAB, Java, VHDL

**Robotics and development:** ROS, Gazebo, Webots, Git, Linux, Bash/Zsh

**Hardware:** PCB design, STM32 development, SMD soldering, Keil, Vivado, EasyEDA Pro

## Selected Awards

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- First Prize, RoboMaster University Championship (National), China. (2023)
- Outstanding Student, SUSTech. (2023, 2024)
- Merit Student Scholarship, SUSTech (Second Class: 2022, 2023; Third Class: 2024).
- Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM), China. (2022)

## Languages

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English: TOEFL 107 | Chinese and Cantonese: Native | German: Beginner