Hengxiang Chen

Robotics, Arbeit Gruppe Dexterous Robotics(AGDR)
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EDUCATION

Shenzhen Technology University (SZTU) Shenzhen, China
Bachelor of Vehicle Engineering Sept. 2021 - June. 2025

- **GPA**: 3.52/4.5 with 14/112
- SZTU X-Talent Program (top 0.1%, based on outstanding academic performance)
- **"1th Craftsman Star" of SZTU**（top 0.1%,two-time winner,2022,2023）
- **Headmaster's Scholarship(**top **1%,2023)**
- Core Courses: Principles of Automatic Control, Intelligent Vehicles and Intelligent Transportation, Automotive Vibration and Noise, Electrical Engineering and Electronic Technology, Automotive Theory, Automobile Structure, Automotive Electronics Technology, etc.

Hochschule Coburg Kronach, Germany
Exchange intern of Autonomous Driving (Master) March. 2021 - Aug. 2024

PUBLICATIONS AND PATENTS

*Equal Contribution

- Z.Feng**,H.Chen**,L.Chen,X.Mou."Path Planning Algorithm Comparison Analysis for Wireless AUVs Energy Sharing System"[J],2023 IEEE Industrial Electronic Technology News (ITeN),2023,(Accepted)
- Z.Guo***,H.Chen***,Q.Li,et al. "Cross Modal Robotic Perception with a Large Vision-Language Model for Physical Property Inference"[J], submitted to CLAW,2025,(Accepted).

RESEARCH EXPERIENCE

Arbeit Gruppe Dexterous Robotics Lab, SZTU Shenzhen, China
Researcher Assistant under Prof. Qiang Li Aug. 2024

➢ Navigation

- Developed a complete autonomous navigation system using ROS, integrating Cartographer SLAM for consistent 2D mapping and localization, A* for global path planning, and DWA for local dynamic obstacle avoidance.
- Conducted quantitative evaluation of SLAM accuracy using APE (Absolute Pose Error) and RPE (Relative Pose Error) metrics via the EVO toolkit, demonstrating sub-decimeter localization performance across varying indoor conditions.
- Enabled robust long-horizon navigation across semantically diverse indoor environments, serving as the spatial foundation for mobile manipulation.

➢ Manipulation

- Constructed a visual-tactile manipulation system based on Kinova Gen3 robotic arm and Gelsight tactile sensor, achieving precise interaction with unknown and irregular objects.
- Proposed a multi-stage grasping framework combining: YOLOv8 for category-agnostic object detection, SAM (Segment Anything Model) for instance-level segmentation, GraspNet-1Billion for 6-DoF grasp pose estimation from RGB-D images.
- Integrated tactile feedback to close the loop during grasp execution, improving grasp success rates

under occlusion and visual uncertainty.

• Realized real-world sim-to-real transfer by fine-tuning vision models and motion strategies initially trained in Gazebo simulation.

SZTU Intelligent Automotive Research Team, SZTU Shenzhen, China

Undergraduate Student under Prof. Xiaolin Mou and Prof. Bian Gong

➢ Vehicle Control and Path Planning

• Control Algorithms: Studied and implemented fundamental vehicle control algorithms, including PID, Pure Pursuit, and Stanley controllers; evaluated algorithm performance through simulations and experimental testing.

• Path Planning: Mastered global planning techniques such as Dijkstra and A* algorithms; local path-planning methods including Time Elastic Band (TEB) and Dynamic Window Approach (DWA) optimized path efficiency and computational performance within simulated environments.

COMPETITIONS

Chinese Outdoor ROS Autonomous Racing Competition Shenzhen, China

Team Leader Dec.2022

• Responsible for software integration, including OpenCV 4.5.1 installation, sensor calibration and debugging, control and planning algorithm development, and overall system tuning.

• Implemented vision-based perception algorithms to determine steering angles, which dynamically influenced wheel control and subsequently regulated vehicle speed during the mapping phase; adopted Pure Pursuit algorithm for path tracking during autonomous navigation phase.

Chinese Robotics and Artificial Intelligence Competition (Intelligent Driving) Hainan, China

June.2023

Team Leader

• Developed a robot navigation system capable of reaching specified target points in minimal time within a closed environment, handling narrow corridors and complex discrete scenarios (e.g., double figure-eight turns formed by cone markers) using Ackermann steering chassis.

• Employed Gmapping for SLAM-based environment mapping, AMCL for localization, and MoveBase for path planning.Implemented a Pure Pursuit (PP) algorithm for real-time target point tracking and path following.

Competition of Intelligent Vehicle Creative Design Remote

Dec.2023

• Autonomous Vehicle Design Project – Qianli Jiangshan Shang

Led the design of a dual-mode concept vehicle supporting both manual and autonomous driving modes. Conducted chassis strength simulation and aerodynamic CFD analysis to validate vehicle design.

Responsible for sensor layout, controller integration, and driving mode switching design. Integrated LiDAR, depth cameras, and GNSS+IMU to support future autonomous driving functions.

SELECTED PROJECTS AND INTERNSHIPS

Research Assistant of X-Talent Shenzhen,China

Sept.2024-present

➢ Academic Service

Assisted in Reviewing Robotics Conference Submissions：

• Worked under the supervision of Prof. Qiang Li on peer review tasks for navigation topic of IET Cyber-Systems and Robotics

- Provided feedback on technical clarity, reproducibility, and algorithmic contribution in the fields of robot control and SLAM

➢ Teaching Assistant：Tactile Robotics, SZTU, Spring 2025

Led discussion/lab sections on topics about Tactile Robotics

Designed experimental practice assignments and provided detailed feedback to students on sensor usage and algorithm implementation.

Internship at Valeo Germany Kronach, Germany

R&D Trainee under System Engineer Yongwei Yang March. 2024 - Aug. 2024

- In this research, we quantitatively analyzes the impact of latency and vehicle speed on remote urban driving control using statistical methods based on simulation and real-world vehicle data. Results show higher latency significantly increases collision risks in scenarios such as protected left turns. Practical countermeasures, including scenario restrictions and local Automated Emergency Braking (AEB), are proposed to enhance remote driving safety.

SZTU Racing Car Studio - AutoBots, a Driveless Formula Team Shenzhen,China

Team Technology Leader of AutoBots March.2022 - March.2024

- Provided academic mentoring and technical Q&A sessions for team members, supporting their learning in autonomous driving systems, robotics, and programming
- Led recruitment for the 2022 and 2023 cohorts, achieving over 200 new student sign-ups across both years

Vice-monitor, Peer mentors of junior students Shenzhen,China

Sept.2022 - June.2025

- Mentored first-year students to help them adapt quickly to university life, including academic routines, campus resources, and daily living