Kun Chen

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Education

Harbin Institute of Technology,Shenzhen — Shenzhen,China
Bachelor of Engineering in Automation — Sep. 2021 - present

- **GPA:** 3.781/4.000, **Rank:** 22/256(8.59%)
- **Honors:**
  - **Best Bachelor Thesis Award of HITsz in Automation** 2025
  - **Outstanding Graduates** 2025
  - **National Scholarship** 2024
  - **National Scholarship for Encouragement** 2022,2023
  - **First Class Academic Scholarship** 2022
  - **Outstanding Student Cadre** 2022
- **Major Courses:**
  Digital Image Processing(98), Machine Vision(91), Probability Theory(96), Complex Analysis(96), Automatic Control Theory: Part A (95) Part B (98), Signal Analysis and Processing(93), etc.
- **Language Proficiency:** IELTS 6.5 (L6.5 R8.0 W5.5 S5.5).
- **Research Interests:** My research is primarily focused on autonomous navigation for mobile robots, like planning algorithms. Currently, I am engaged in research with embodied robot-manipulation, robotic planning and robotic perception.

COMPETITION AWARD

- RoboMaster University Technical Challenge — **National First Prize** — 2022.08
- Siemens Cup China Intelligent Manufacturing Challenge — **Provincial Second Prize** — 2023.08
- National Undergraduate Smart Car Contest — **Provincial Third Prize** — 2023.07

Publications

Li Yuxiang*, **Chen Kun***, Chen Haoyao (2024). "Collaborative Autonomous 3D Reconstruction for Heterogeneous Multiple UGVs in Complex Environments". In: *2024 International Annual Conference on Complex Systems and Intelligent Science (CSIS-IAC)*. IEEE, pp. 858–865.

Li Yuxiang, **Chen Kun**, Wang Yifei, Zhang Weifan, Wang Jiancheng, Chen Haoyao, Liu Yunhui (2025). "Real-Time Multilevel Terrain-Aware Path Planning for Ground Mobile Robots in Large-Scale Rough Terrains". In: *IEEE Transactions on Robotics* 41, pp. 4159–4179. DOI: 10.1109/TRO.2025.3577015.

* indicates equal contribution.

Experience

- **Research on Embodied Robot-Manipulattion with Dexterous Hand** — Jul. 2025 - present
  nROS-Lab — Harbin Institute of Technology,Shenzhen
  Advisor: Prof.Haoyao Chen — Department of Mechanical Engineering and Automation.
  - **Introduction:** Built robotic manipulation simulation environments in MuJoCo and explored learning-based control methods, including diffusion policy, for grasping tasks.
  - **Involvement:**
    * Developed a robotic arm grasping environment in MuJoCo and collected expert demonstration

datasets through keyboard teleoperation.

  - Trained a Diffusion Policy with joint states and object positions as inputs, enabling the model to generate action sequences for grasping tasks.

- **Research on Cross-Floor Autonomous Exploration** Nov. 2024 - Jul. 2025
  nROS-Lab Harbin Institute of Technology,Shenzhen
  Advisor: Prof.Haoyao Chen Department of Mechanical Engineering and Automation.
  - **Introduction:** Developed a cross-floor autonomous exploration framework for complex building environments, addressing inefficiencies and incomplete reconstructions in traditional multi-floor robotic exploration.
  - **Involvement:**
    - Proposed a robust and efficient stair detection method by fitting stair step edges from point cloud data, with a maintained stair set and semantic integration into the map to support dynamic semantic updates.
    - Proposed a priority-driven task planning scheme: formulated the Sequential Ordering Problem (SOP) using OR-Tools for global task sequencing, while employing Traveling Salesman Problem (TSP) optimization for efficient local planning.
- **Research on Heterogeneous Multiple UGVs** Apr. 2024 - Aug. 2025
  nROS-Lab Harbin Institute of Technology,Shenzhen
  Advisor: Prof.Haoyao Chen Department of Mechanical Engineering and Automation.
  - **Introduction:** Proposed a hierarchical view planning framework to achieve near-optimal task allocation, effectively coordinating the view tasks of robots with different capabilities.
  - **Involvement:**
    - Introduced map frontier, highly sparse grid cell, and occupied grid cell with observation angles exceeding thresholds as Incomplete Surface Elements (ISE). Then, classify and aggregate these ISEs.
    - Modeled the viewpoint allocation problem for heterogeneous multi-robot systems in complex environments and solved it using the Genetic Algorithm.
    - Improved supervoxel segmentation algorithm that achieves both geometric semantic representation and data compression.
    - Introduced gimbal encoder-based odometry information as an observation model to correct the state estimation of the Kalman filter during the horizon LiDAR SLAM process, effectively addressing the SLAM drift issue.
  - **Outcome:** Wrote the paper ***Collaborative Autonomous 3D Reconstruction for Heterogeneous Multiple UGVs in Complex Environments*** (as the co-first author) and currently preparing another journal manuscript targeting submission to IEEE Transactions on Robotics.
- **Research on Path Planning of Articulated Tracked Robot** Jan. 2024 - Sep. 2024
  nROS-Lab Harbin Institute of Technology,Shenzhen
  Advisor: Prof.Haoyao Chen Department of Mechanical Engineering and Automation.
  - **Introduction:** Proposed a real-time multi-level terrain-aware path planning framework to improve efficiency and success rates for autonomous robots navigating large-scale rough terrains.
  - **Involvement:**
    - Integrating terrain roughness, slope, and sparsity as terrain complexity, used as cost, deploy A* for the robot's global path planning.
    - Participated in the assembly and maintenance of articulated tracked robots and set up physical and simulation experiment environments.
    - Analyzed and processed experimental data, drew paper pictures, and wrote papers.
  - **Outcome:** Wrote the paper ***Real-Time Multi-Level Terrain-Aware Path Planning for Ground Mobile Robots in Large-Scale Rough Terrains*** (as the second author), which was accepted to IEEE Transactions on Robotics(TR-O).

Skills

Programming	C, C++, Python, MATLAB, LaTeX
Tools	ROS, Gazebo, SolidWorks, Git, Altium Designer