

YIWEN YING

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ACADEMIC EXPERIENCES

Southern University of Science and Technology **2022.08-2026.06**
Information Engineering, Department of Electronic and Electrical Engineering
➤ **GPA: 94.58/100 | 3.92/4.0 | 80% credits A/A+ Rank: 3/43 English: CET6 - 604**
Calculus (96+94) Linear Algebra (95) Probability and Statistics (97) C Programming (98)
Data Structures and Algorithm Analysis (95) AI and Machine Learning (98) FPGA Design (97)
Mobile Robot Navigation and Control (94) Robotic Motion and Control (93)

RESEARCH EXPERIENCES

➤ RCV LAB	Dept. of EE, SUSTech	Supervisor: Prof. Hong Zhang	2023.06-Present
➤ FAST LAB	Coll. of CSE, ZJU	Supervisor: Prof. Fei Gao	2025.01-2025.09
➤ CV-AI LAB	Dept. of EE, THU	Supervisor: Prof. Liangrui Peng	2024.08-2024.11

- **MfNeuPAN: Proactive End-to-End Navigation in Dynamic Environments via Direct Multi-Frame Point Constraints, 1st-author paper accepted by 2025 IEEE International Conference on Robotics and Biomimetics (IEEE ROBIO 2025).**

Overview: A proactive, end-to-end local planning framework for efficient navigation in complex dynamic environments by incorporating predictive collision avoidance, addressing the inefficiencies of reactive, static obstacle avoidance strategies.

Contributions: The proposed method leverages multi-frame sensory data and employs DBSCAN clustering in conjunction with nearest-neighbor matching for accurate obstacle state estimation. Gaussian Mixture Models are utilized to predict obstacle trajectories. Inspired by NeuPAN, a deep unfolded network extracts latent obstacle features, which are integrated into a Model Predictive Control trajectory optimization module for dynamic obstacle avoidance.

Results: The generated trajectories are shorter and more efficient compared to baselines. Ablation studies validate the optimality and necessity of each proposed component.

- **DiColK: Generating Diverse and Collision-free Inverse Kinematics Solutions for Mobile Manipulators via Diffusion, proposed 1st-author submission to IEEE Robotics and Automation Letters (IEEE RA-L).**

Overview: A novel framework for solving the inverse kinematics (IK) problem of mobile manipulators, enabling efficient path planning with comprehensive coverage of the solution space and enhanced applicability through the incorporation of nonlinear constraints.

Contributions: A diffusion-based framework incorporates Transformer mechanisms, with optimization using the L-BFGS algorithm to generate desired IK solutions.

Results: Expanded the coverage of the solution space, encompassing the reachable workspace. Incorporated environmental representations into the inference process, enabling collision avoidance. The accuracy of the solutions is improved from the decimeter to the millimeter level.

- **Text3D: A Dataset and Benchmark for 3D Object Text Perception, submitted to 2026 Computer Vision and Pattern Recognition Conference (IEEE CVPR 2026).**

Enhanced the DUST3R framework with ROI-focused processing and optimized gradient descent to enable accurate and smooth 3D reconstruction, with the improved system contributing to dataset building and supported the development of the associated paper.

- **SD-Loc: Global Localization in Challenging Semi-Dynamic Environment**

Developed a loss-weight registration re-localization SLAM algorithm for semi-dynamic environments, implemented real-world and automated simulation experiments, achieving around 60% re-localization success where existing methods often fail.

- **Fully Automatic Task-Oriented Air-Ground Cooperative Robot System, selected as a National-Level Project in College Students' Innovative Entrepreneurial Training Plan.**

Designed UAV visual perception with RGB cameras, Intel RealSense D435i, OpenMV and K210 for environmental awareness, implemented UWB-localized A*-guided STM32/stepper motor wheeled robots, and built a ground control station with wireless communication for real-time monitoring; the system achieved target recognition and synchronized air-ground operations.

- **Universal Delivery Robot, selected as a School-Level Project in Guangdong Sci-Tech Innovation Program.**

Enabled robots to autonomously press elevator buttons without requiring a dedicated receiver. Deployed an OCR-RCNN-based button recognition system to support manipulator.

- **Point Cloud World Model-Powered Dynamic Navigation System, selected as a School-Level Project in Guangdong Sci-Tech Innovation Program.**

Developed navigation system via World Model, PointNet++ and MPC control.

- **Sign Language Translation System, outstanding project named by EE Dept.**

Conducted data preprocessing and built a dataset, adopted CNN and ViT for visual feature modeling, and integrated TTS with sequence construction to translate RGB video to speech.

RESEARCH INTERESTS

My research interests focus on **learning-based motion planning**. Have comprehensive capabilities in full-stack robotics development including perception, planning and control, with expertise in the field of motion planning, SLAM, machine learning, and computer vision. My programming expertise spans Python, C++, and MATLAB.

HONORS & AWARDS

- 2025, **Nominee of Seeking Truth Scholarship**, SUSTech. (**Top 6/** all undergraduates, 5000)
- 2025, **Nominee of Annual Student Model**, SUSTech. (**Top 6/** all undergraduates, 5000)
- 2024, **Student Model of Excellence**, SUSTech. (**Top 7/** all undergraduates, 5000)
- 2023, **Outstanding Student**, SUSTech. (Top 489/ all undergraduates, 5000)
- 2024, **Outstanding Student Scholarship Second Prize**, SUSTech. (Top 15%)
- 2023, **Outstanding Student Scholarship Second Prize**, SUSTech. (Top 15%)
- 2023, **First Prize**, Guangdong Province, National University Math Competition. (Top 7%)

SOCIAL WORK

- President of the Student Union, Dept. of EE., SUSTech
- Peer Mentor of Undergraduate Course, Signal and System, Dept. of EE., SUSTech