KANG Haolan

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EDUCATION

The University of Hong Kong Hong Kong, China | Sep. 2025- July. 2026
Master of Science in Engineering in Robotics and Intelligent Systems | In coming student

South China University of Technology Guangdong, China | Sep. 2021- Jun. 2025
Bachelor of ***Engineering*** in Intelligent Manufacturing | Average Score: 84.8/100.
Highlighted Modules*:*
C++ Programming Foundations, Introduction to Engineering, Python Programming Foundations, Data Structures and Algorithms, Introduction to Circuits (Practice), Artificial Intelligence Technology and Applications, Data Analysis and Modeling, Modeling, Analysis, and Control of Dynamic Systems.
Awards and Honours:
Nov.2024 Best award of outstanding research findings of the 26th China Hi-Tech Fair;
Apr.2023 First Prize of 2023 Algorithm Competition for College Students;
Jan.2023 First Prize of the 2022 National College Students' English Reading Competition;
Dec.2022 Second Prize of TCL Huameng Scholarship for the Academic Year 2021-2022;
Dec.2022 Second Prize of Scholarship for the Academic Year 2021-2022;
Sep.2022 Third Prize of 2022 Electronic Design Competition for Guangdong University Students.

University of Pennsylvania PA 19104 | Jan. 2024 - Feb. 2024
Joined a one-month exchange programme with a focus on robotics and intelligent systems as well as technological innovations and received an exchange scholarship of up to RMB 5,000.
Highlighted Modules: Leadership 96.53/100, Persuasive Speaking & Writing 95/100, Innovation & Technology 88.82/100.

WORKING EXPERIENCES

Shenzhen Institute of Artificial Intelligence and Robotics for Society (AIRS) Shenzhen, China | Mar. 2024 – Jan. 2025
Research Assistant

- Adopted the Realsense L515 camera to acquire rgbd data, and carried out point cloud densification and denoising, which improved the accuracy of object depth estimation. Meanwhile, we utilized models such as Dinox, GroundSAM, and Clip to detect and segment target objects in the image data. The optimal grasping pose of the dexterous hand was estimated based on the geometric features of the objects. During the pose generation process, we used an IK solver to filter out poses that might cause collisions.
- Worked on extracting the intent from human instructions with help of VLM like gpt4o. Through prompt tuning, we designed a method that can understand human intent, extract the objects people want to operate, and then conduct semantic enrichment based on multimodal information to provide better segmentation prompt information for downstream tasks.
- Operated Franka, UR5, and RealMan robotic arms to achieve joint or space pose with end effector of Inspire, Ruiyan, and BrainCo dexterous hands. To test and optimize our algorithms, we imported URDF models of these robots into the Sapien simulation environment. Using motion planners, we conducted trajectory planning and completed tasks like pick&place, object rotation, and drawer opening.
- Designed a set of *Operating System for Dexterous Robot Hand Based on a Large Language Model*, which was displayed in Shenzhen Capital Group Co., Ltd. and 26th China Hi-Tech Fair. Our work has been reported across Shenzhen tv and CCTV.

PROJECT EXPERIENCES

TinyML-based Human Activity Recognition Smart Watch Project Sep. 2023- Jan. 2024
Project Leader

- Dedicated to the development of a smart watch integrating TinyML and deep learning algorithms, which efficiently and accurately identified the user's daily activities and possessed the ability to collaborate with smart home devices;
- Led the implementation and optimisation of the TinyML model for deployment on ultra-low-power microcontrollers, which enabled local data analysis and processing, significantly decreased latency, and enhanced user privacy protection and data security.

Development of Smart Glasses for Assisting Memory Recall in Elderly Jan. 2023- Dec. 2023

- Supervised by Prof. Tan Boon Huan from Nanyang Technological University, involved in the research and development project of memory-assisted smart glasses for the elderly, which received a research grant of **RMB 100,000** with a value of **RMB 10 million**;
- Undertook the hardware integration and software design of smart glasses, including the selection and integration of modules such as camera, microphone, and loudspeaker, in addition to the implementation of data processing algorithms based on microcontrollers.

Research and development and competition of Plastic Sealing Ring Collection and Launching in ROBOCON,
The 22nd China University Robot Competition Jul. 2023

- Designed and implemented the robot chassis control system, including the selection and debugging of the omni-directional wheel movement system, the optimisation of the WiFi communication protocol and the coding of the control code;
- Researched and developed two robots that cooperated with each other and gained the **third prize** in the national competition;
- Practised mechanical design and embedded system development capabilities, and also got a profound appreciation of the advantages of teamwork and project management.

Design of Robotic Ball Collector with FreeRTOS and OpenMV Jan. 2023 - Jun. 2023

- Acted as a team leader for the design and implementation of a robotic ball collector based on the FreeRTOS real-time operating system and OpenMV camera module;
- Spearheaded the design and implementation of a PID controller for precise control of the speed and direction of the motors for accurate capture and transport of the balls;
- Won the **Second Prize** in the Competition of Multifunctional Robot in the Course of Engineering Innovation Training, adequately demonstrating the ability of robot design and control system integration.

Development of a Millimeter Wave Radar-Based Living Detection Device for Electric Vehicle Wireless Charging Safety Dec. 2022

- Attended the research and development of a safety monitoring system for wireless charging of electric vehicles, which monitored the electromagnetic field distribution during wireless charging in real time using millimetre wave radar technology for reducing the impact of electromagnetic radiation on human beings and animals;
- Committed to the design and implementation of the millimetre wave radar sensor board, as well as the data communication and processing with the STM32 ;
- Won project innovation funding in the Guangdong Provincial Government's funding up to **RMB 20000**;
- Obtained **Project Innovation Award** in the 18th *Winning in Guangzhou* and Guangdong-HongKong-Macao Greater Bay Area Entrepreneurship Competition for College Students, and awarded **Winning Prize** in the 8th China College Students' "Internet+" Innovation and Entrepreneurship Competition at South China University of Technology.

PAPERS AND PATENTS

- Li. J.; Ye. K.; **Kang. H.**; Liang. M.; Wu. Y.; Liu. Z.; Zhuang. H.; Huang. R.; Chen. Y.; Grasp What You Want: Embodied Dexterous Grasping System Driven by Your Voice. Journal of field robotics 2025 (under review)
- Li. Y.; Gong. Z.; Li. H.; Huang. X; **Kang. H.**; Bai. G.; Ma. X.; Robotic Visual Instruction. CVPR 2025 (Accept, 3 positive review)
- **Kang, H.**; Lang, X.; Gao, M. (2023). Research on Live Detection Technology in Wireless Charging of Electric Vehicles based on Milli-meter Wave Radar. EI index.
- **Kang, H.**; Wang, W.; Zhang D. (2023). A Shared Bike Sorting and Transportation Vehicle for Machine Vision. Chinese Patent.
- Huang, Z.; Qing, T.; **Kang, H (2022)**. Wireless Charging System and Method Based on Primary Side Controllable Capacitive Compensation. Chinese Patent.
- Fang, D.; **Kang, H**. (2023). An Automatic Acquisition Device for Images and Their Pose Information Used in Three-dimensional Reconstruction. Chinese Patent

EXTRACURRICULAR EXPERIENCES

School Robotics Club Sep. 2021- Sep. 2024

Student Co-Founder

- Designed to associate students with a strong interest in robotics and build a platform for technical exchange, cooperation and competition;
- Dedicated to mechanical and electronic design, to promote the club's ongoing development and innovation in the field of robotics competition;
- Conduct regular technical seminars, workshops and presentation activities to facilitate members' knowledge sharing and skill enhancement.

InnoX Summer Camp 2024, Shenzhen InnoX Academy Aug. 2024

- Learned and practised Design Thinking, First Principles Thinkings and Maslow's Hierarchy of Needs during the two-week summer camp;
- Participated in the innovative research and development process of smart hardware solutions, successfully transformed innovative thinking into actual products, demonstrated the whole product management process from conceptualisation to prototyping, and exemplified excellent problem-solving and innovation skills.

ADDITIONAL SKILLS

Language: Native in Chinese, Fluent in English.

Certificate: Qualifications for Certified Microcontroller Development Engineers.

Self-evaluation:

- Competent in Python and C/C++ with a foundation in algorithms and data structures;
- Well-versed in AI technologies such as TinyML, Deep Learning, and Machine Learning;
- Proficient in embedded system development, including STM32, Arduino microcontroller programming, and debugging;
- Mastery of Ubuntu system operation, VSCode programming environment, and SSH remote connection technology;
- Thorough understanding of 2D image recognition technology, and multimodal interaction technology.