

Junshan Huang

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Educational Background

University of Science and Technology of China (USTC)
 Bachelor of Engineering in Artificial Intelligence

September 2021 - July 2025 (expected)

GPA: 3.85/4.3 (89.63/100) **Rank:** 10% (2.5% in 3rd year)

Selected Courses: Computer Programming (96), Introduction to Computing Systems (95), Fundamentals of Computer Control (95), Principles of Computers and Embedded Systems (95), Basic Technology of Embedded System Design (A+), Design Innovation (95), Parallel Computing (95)

Publications

Enhancing Open-Vocabulary Scene Graph Generation with Continuous Surface Modeling and Concept Activation (In preparation) 2025

J. Huang, L. Lin, C. Long.

UniFaRN: Unified Transformer for Facial Reaction Generation October 2023

C. Liang, J. Wang, H. Zhang, B. Tang, J. Huang, S. Wang, and X. Chen, in MM '23: Proceedings of the 31st ACM International Conference on Multimedia, 2023, pp. 9506-9510.

Research Experiences

Open-Vocabulary Scene Graph Generation September 2024 - Present
 Hong Kong University of Science and Technology (HKUST), supervised by Prof. Long Chen

- Addressed the rigidity of current description-based open-vocabulary methods by leveraging concept activations from hidden states of large pretrained models as sparse supervision.
- Represented the property space using a continuous surface, enabling comprehensive modeling across the entire space with sparse supervision.
- Integrated a semantically enriched fusion model, leveraging object semantics and visual features to enhance relationship recognition by reducing interference from irrelevant objects and incorporating semantic relations.

Open-Vocabulary Object Detection on Hyperbolic Space July 2024 - August 2024
 Hong Kong University of Science and Technology (HKUST), supervised by Prof. Long Chen

- Applied a hyperbolic classification head to improve the object detection performance, achieve **2.35%** AP50 improvement on V3Det dataset compared to baseline.
- Conducted experiments on different types of hyperbolic models, classification methods and training objectives.
- Solved the numeric stability issue of hyperbolic training.

Large Language Model (LLM) Empowered Financial Agent System September 2023 - May 2024
 University of Science and Technology of China (USTC), supervised by Prof. Yi Zhou

- Developed the core framework enabling LLMs to interact with databases, text corpora, and inference engines to provide users with precise and intelligent question-answering services.
- Innovated hierarchical structure to enable complex interactions between LLM and databases.
- Fine-tuned a large language model to accurately generate and interpret a specific JSON format.
- Implemented the system for a brokerage firm, currently in trial operation phase.

Automatic Human Facial Reaction Generation April 2023 - July 2023
 University of Science and Technology of China (USTC), supervised by Dr. Liang Cong

- Utilized the idea of tokenization to formalize the facial reaction generation task.
- Contributed to data preprocessing code, including the extraction and tokenization of multi-modal features from the input.
- Investigated the selection of a 3D face generation model for the final demonstration.

Automated Solving of IMO-level Math Problems

March 2023 - August 2023

University of Science and Technology of China (USTC), supervised by Prof. Yi Zhou

- Designed and improved a math annotation language, which is used to build an inference engine.
- Created an IMO question dataset using the annotation language we developed.
- Implemented ChatGPT to help with annotation task, significantly improve the efficiency.

Course Projects & Competition**Design Innovation: Assistive Robots at Home**

July 2023 - Jan 2024

(1) Emotional Companion Robot ([Code](#))

- Utilized LLM and Langchain to built a paper robot that can show corresponding face expression based on current speech context, providing emotional companion.

(2) Kitchen Assisting Robot ([Report](#), [Slides](#))

- Led the group to conduct needs assessment, persona validation, benchmarking, affinity map synthesis, and proposal screening
- Designed at a kitchen-assisting robot that helps prepare food ingredients.
- Developed the UI and user experience design and contributed to mechanical structure.

RoboGame: Designed a Robocar from Scratch to Compete in a Curling Game July 2022 - October 2022

- Designed and coordinated the overall electrical layout, including power and control circuits, ensuring strong-weak current isolation and system integration.
- Implemented mecanum wheels to achieve agile movement for the robocar and applied a PID control algorithm.
- Built and a tracking disc to assist the robocar in reaching specific locations utilizing ground indicators.
- Developed the algorithm to leverage angular sensors for precise navigation, allowing movement independent of on-ground guide lines.
- Designed a pneumatic system to enable the precise gripping and releasing of curling stones.
- Constructed an computer vision algorithm for reliably identifying curling stones.

Parallel Computing: Acceleration of N-Body Stimulation ([Code](#), [Slides](#), [Report](#)) February 2024 - June 2024

- Analyzed the runtime performance of various components in the simulation algorithm and investigated the memory arrangement.
- Developed a unique computational method by optimizing the arrangement of GPU memory and refining the computation sequence to maximize GPU utilization.
- Improved the stimulation speed by **122%** compared to Nvidia's Fast N-Body Simulation algorithm.

Extracurricular**USTC Innovation and Entrepreneurship Fund Management Team**

October 2023 - July 2024

- Conducted due diligence and reviews and practiced fund management skills.

USTC Student Union

February 2022 - February 2023

- Promoted school activities and maintained social media accounts for Student Union.

Skills**Programming:** Python (Advanced), C/C++ (Proficient), Matlab (Intermediate)**Domain Knowledge:** Embedded System Programming(STM32), Object Detection, ROS, LLM**English:** TOEFL 107 (Reading 30, Listening 30, Speaking 22, Writing 25)**Honors & Awards**

AI Talent Program Scholarship, USTC (only 4 Students)

October 2024

Shenzhen Stock Exchange Scholarship

October 2023

First Prize in ACM REACT 2023 Multimodal Challenge

July 2023

Distinguished Student Union member 2022&2023

March 2023

Silver Award in 8th 'Internet+' Innovation and Entrepreneurship Competition

February 2023

Third Prize in RoboGame Robot Competition, USTC

December 2022