Curriculum Vitae

# Junshan Huang

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## Educational Background

**University of Science and Technology of China (USTC)** September 2021 - July 2025 (expected)
Bachelor of Engineering in Artificial Intelligence

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

**Seletected 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