Yijia Wang

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EDUCATION

Southern University of Science and Technology (SUSTech) Shenzhen, China
Undergraduate, GPA: 3.90/4.00 (WES Evaluated: 3.98/4.00), rank: 2/22 *Sep. 2022 - present*
- Bachelor of Engineering in *Communication Engineering (expected)*
- Member of the Innovation Experimental Class (***top 10%***)

Stanford University California, US
Exchange Student, GPA: 4.00 *Jun. 2024 - Aug. 2024*
- Course: CS161 Design and Analysis of Algorithms (A), EE364A Convex Optimization I (A)

PUBLICATIONS

[1] Weiming Chen*, **Yijia Wang***, Zhihan Zhu, Zhihai He. Generative Semantic Coding for Ultra-Low Bitrate Visual Communications and Interactions. *IEEE Transactions on Image Processing. (Under review, JCR Q1, IF=13.7)*. https://arxiv.org/abs/2510.27324.

[2] Weiming Chen, Zhihan Zhu, **Yijia Wang**, Zhihai He. Runge-Kutta Approximation and Decoupled Attention for Rectified Flow Inversion and Semantic Editing. *ICLR 2026 (Under review)*. https://arxiv.org/abs/2509.12888.

[3] **Yijia Wang**, Yiqing Shen, Weiming Chen, Zhihai He. Understanding User Intention with LLM Reasoning for Complex Image Editing Tasks. https://arxiv.org/abs/2510.27335.

PATENTS

[1] Zhihai He, Weiming Chen, **Yijia Wang**, Zhihan Zhu, Template-Replacement Image Compression & Reconstruction Method, System and Storage Medium. App. No.: CN 202511281423.X, *accepted by CNIPA*

[2] Zhihai He, Weiming Chen, Zhihan Zhu, **Yijia Wang**, Jian Ouyang, Image Editing Method Based on Attention Decoupling, Device, Terminal and Storage Medium. App. No.: CN 202511281645.1, *accepted by CNIPA*

RESEARCH EXPERIENCE

Artificial Intelligence Lab at SUSTech *Jun. 2024 - Present*
***Research Assistant & Core Member**, Advisor: Professor Zhihai He, IEEE Fellow*

Generative Semantic Coding for Ultra-Low Bitrate Visual Communications and Interactions
Mar. 2025 - Present
- Proposed the Generative Semantic Coding (GSC) framework, combining text description and coding latents to reconstruct visual scene using only 10% of the bitrate in traditional methods, while not sacrificing the accuracy of vision analysis.
- Introduced a joint text-latent guided image generation method that combines text prompts and selected channels of latents to guide the image generation process, ensuring both semantic and structural details in reconstructed images.

Runge-Kutta Approximation and Decoupled Attention for Rectified Flow Inversion and Semantic Editing
Mar. 2025 - May 2025
- Incorporated the Runge-Kutta method into the RF sampling process for the differential trajectory, and proposed a high-fidelity inversion method that better aligns the inversion and denoising paths in the sparse latent space.
- Introduced a decoupled attention mechanism that decouples the entangled text and image attention in MM-DiTs, enabling precise semantic editing in MM-DiT architectures.

Understanding User Intention with LLM Reasoning for Complex Image Editing Tasks *Dec. 2024 - Mar. 2025*
- Proposed using foundation models to decouple images to get semantic structural representations, enabling visual reasoning and editing without joint fine-tuning of LLMs and DMs.
- Designed a chain of semantic structural representation update methods, enabling multi-step reasoning through progressive refinement of the semantic structural representations and addressing complex implicit queries that require world knowledge and inference.

Human-Machine Knowledge Expression and Interactive Learning System, *funded by the "Climbing Plan" Program*
Team Leader *Oct. 2023 - Sep. 2024*

- Developed a neural network-based intelligent image data labeling system, achieving three-level annotation, including image level, instance level, and pixel-level.
- Introduced deep learning models (ExpansionNet v2 and EdgeSAM) and natural language processing tools (SpaCy) to enhance annotation efficiency.

Posture Detection for Elderly People in Indoor Scene *Feb. 2024 - Jun. 2024*

- Developed a deep learning-based system for real-time posture detection of elderly individuals in indoor scenes, using YOLO X for object detection, RTMPose for keypoint estimation, and EdgeNeXt for behavior classification.

Other Selected Research Projects

SkyNet Eagle Vision: Cellular Network-based Passive Radar Monitoring Technology for Drones
Core Member, Advisor: Prof. Rui Wang *Oct. 2024 - Aug. 2025*

- Pioneered the integration of sensing and communication by utilizing cellular base stations for passive drone monitoring, reducing costs and energy consumption while enhancing stealth and accuracy.
- Advanced drone trajectory tracking by employing Doppler frequency shift detection and specialized algorithms, achieving high-precision monitoring that overcomes limitations of traditional radar systems.

End-to-End Glob Automated Analog EDA Industry Chain, *funded by the "Climbing Plan" Program*
Core Member, Advisor: Prof. Junmin Jiang *Oct. 2024 - Aug. 2025*

- Integrates Graph Neural Networks (GNN) and Reinforcement Learning (RL) into the front-end and back-end processes of analog integrated circuit design, significantly improving design efficiency and performance while reducing reliance on manual experience.
- Achieved intelligent design from circuit topology generation, size optimization, to automatic layout and routing of the layout.

SELECTED COURSE PROJECTS

The Third Eye for Blind People *Nov. 2024 - Jan. 2025*

- Developed an assistive device using Raspberry Pi, ultrasonic sensors, vibration feedback, and AI-based voice guidance.

Seam-Carving *May 2024 - Jun. 2024*

- Developed a content-aware image resizing system using Java, featuring a user-friendly GUI.

"Jungle Chess Game" Project *May 2023 - Jun. 2023*

- Developed a rule-complete game using Java with GUI, multiplayer support, AI opponent, and save/load functionality.

Bluetooth Balanced Intelligent Car *Oct. 2023 - Dec. 2023*

- Developed a two-wheeled obstacle-avoiding smart car with Bluetooth control and autonomous navigation features.

SCHOLARSHIP AND AWARDS

2024-2025 BYD Scholarship ***(Top 0.5%)*** *Nov. 2025*
2024-2025 Joyce M.Kouk Scholarship ***(Top 0.7%)*** *Sep. 2025*
2024-2025 First-Class Scholarship for Outstanding Students, SUSTech ***(Top 2%)*** *Sep. 2025*
Silver Award in 2025 China International University Students Innovation and Entrepreneurship Competition, Guangdong ***(Top 0.07%)*** *Aug. 2025*
2023-2024 Second-Class Scholarship for Outstanding Students, SUSTech ***(Top 5%)*** *Sep. 2024*
2nd Prize in the 2023 China Undergraduate Mathematical Contest in Modeling, Guangdong ***(Top 15%)*** *Jan. 2024*
2022-2023 Star of Practice Scholarship, SUSTech ***(Top 1%)*** *Sep. 2023*
2022-2023 First-Class Scholarship for Outstanding Students, SUSTech ***(Top 2%)*** *Sep. 2023*

ADDITIONAL INFORMATION

Leadership Experience: Served for two years in the ZhiRen College Student Union and SUSTech Student Association, organizing five university-level events with over 3,000 participants.
Volunteer Experience: Engaged in 64 volunteer service activities in three years, with a total of 184 volunteer hours.
Sports: Participated in numerous sports competitions and achieved notable awards, including in events such as the Ergometer Rowing Competition and Campus Running Points Competition.
Hobbies & Interests: Piano (Level-10), Hulusi (Level-8)