Ziyue Peng

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EDUCATION

Zhejiang University Hangzhou, China

BEng. Robotic Engineering (Honors Degree) GPA: 4.18/4.3 Rank: 1/44 Expected Jun.2026

EXPERIENCES

The University of Texas at Austin Austin, United States

Research Internship Department of Computer Science Jun.2025 – Oct.2025

University of Toronto Toronto, Canada

Exchange Program Applied Science and Engineering GPA: 3.93/4.00 Sept.2024 – Dec.2024

SELECTED AWARDS

- Chu Ko-Chen Scholarship *(Highest Honor of Zhejiang University)* 2025
- National Scholarship 2023 & 2024
- Zhejiang University First-Class Scholarship 2023 & 2024
- Zhejiang University Outstanding Student Award 2023 & 2024
- First Prize in National College Students Mathematics Competition 2023
- First Prize in Zhejiang Province College Students Physics Competition 2023
- First Prize in Zhejiang University Robot Competition 2024
- First Prize in the National Olympiad in Informatics 2020

PUBLICATION

- Yi Yang, **Ziyue Peng**, Kang Zhang, Xincheng Tan, Fan Lu, Jingting Ding, Kecheng Zheng, Minfeng Zhu, Wei Chen, "HiTag: Hierarchical Image Tagging with Hyperbolic Vision–Language Modeling," in *CVPR 2026* (under review).

RESEARCH PROJECTS

Physical Understanding from Real-World Video The University of Texas at Austin

Advisors: Qixing Huang, Brandon Y. Feng, Chandrajit Bajaj, Etienne Vouga Jun.2025 – Present

- Lead a research project focused on achieving physical understanding of dynamic objects from videos, with an emphasis on overcoming the sim2real generalization challenge.
- Modified the Material Point Method simulator for greater physical accuracy, creating a large-scale synthetic dataset of 200K video-physical parameter pairs of falling objects.
- Designed novel models that take geometric representations (e.g., depth and optical flow) as input to predict physical parameters, and fine-tuned pre-trained 3D foundation models to boost generalization and bridge the sim-to-real gap.
- Captured and processed a real-world dataset of 100 videos (20 objects × 5 trials) and established a benchmark with a re-simulation based evaluation method. Experiments are still ongoing, with preparation for a SIGGRAPH 2026 paper.

Hierarchical Image Tagging with Hyperbolic Vision-Language Modeling Zhejiang University

Advisors: Wei Chen, Minfeng Zhu Jan.2025 – Jun.2025

- Designed a 10-level, 3 334-tag hierarchy by fusing WordNet, YAGO, and manual curation for hierarchical tagging system.
- Proposed a tagging method in hyperbolic space that jointly models relationships among tags, images, and captions, leveraging its inherent suitability for representing tree-structured data to improve open-set tagging performance.
- Released a benchmark with 2.87 M CC3M training images and 57 K manually annotated Open Images test images, together with an evaluation toolkit covering tree-edit distance, Jaccard similarity, hierarchical precision, and hierarchical recall.
- Co-authored the CVPR 2026 paper and produced all key figures; contributed to experiment and result visualization.

Sim2Real Style Transfer for Surgical Robot Rope Cutting University of Toronto

Advisor: Lueder Kahrs Nov.2024 – Jan.2025

- Developed a sim-to-real pipeline for rope-cutting tasks on the *dVRK* surgical robot. The reinforcement-learning policy is trained in Unity simulations; a selected scene is transferred to realistic style via diffusion to narrow the domain gap.
- Leveraged 16 parallel Unity environments (15 vanilla, 1 stylized) for PPO-based RL. At each decision step, replaced that 1 environment's visual observation with the stylized frame and pushed all 16 environments into the mlagents' buffer.
- Implemented a modified Stable Diffusion during RL training: in the reverse diffusion, injected the Q and K matrices from real surgical style images into those of simulation observations to fast impose realistic style while keeping the contents.
- Applied domain randomization across lighting conditions, camera viewpoints, and cutting-target positions to enhance policy robustness; real-robot deployment is currently underway by lab collaborators.

Multi-robot's Navigation and Exploration Based on Omnidirectional Control Zhejiang University
National Innovation Program Advisor: Yuanchao Shu Jun.2023 – May.2024

The project was recognized as a national level outstanding project.

- Developed a modular and reusable control, mapping, localization, navigation and self-exploration program for multi-robot systems on a Mecanum wheel chassis, providing a versatile platform for high-level planning algorithms as well as ROS-based simulation and real-vehicle validation.
- Optimized omnidirectional control and navigation by adding a recovery mechanism that reduces inflation layers in narrow passages, enhancing maneuverability and keeping obstacle avoidance in constrained environments.
- Refined RRT-based exploration and frontier management by incorporating Busy Cost Weighting to avoid repeated assignments, Forward Exploration Weighting to mitigate radar blind spots, Frontier Width Filtering to eliminate unreachable gaps, and a TF Waiting Routine to prevent miscalculations from delayed coordinate transformations.

SKILLS

Python, C++, CUDA, D3.js, Figma, ROS, Unity, MATLAB, SolidWorks, Origin, LaTeX, STM32, C51, Lingo, AutoCAD

LEADERSHIP EXPERIENCE

The Hangzhou 19th Asian Games Aug.2023 – Oct.2023

Technology Volunteer

- Coordinated official score distribution at the Zhejiang University (Zijingang Campus) Gymnasium by operating RPDS machines, verifying results, and delivering them to relevant areas.
- Served as an English translator between basketball teams and the technical staff.

Student Innovation and Entrepreneurship Center, Zhejiang University Sep.2023 – Jun.2024

Vice President

- Oversaw administrative coordination among the university, student innovation teams, startups, alumni networks, industry partners, and funding sources, while managing the innovation and entrepreneurship base.
- Organized and promoted the annual "Entrepreneurship Journey" competition to foster campus-wide innovation.

EXTRACURRICULAR EXPERIENCE

Varsity Swimming Team, Zhejiang University Oct.2023 – Present

Team Member

- Bronze Medal in Men's 50m Breaststroke at Zhejiang University Swimming Competition, 2023
- Gold Medal in "Speed Rescue" at Zhejiang University Swimming Competition, 2023

Piano Association, Zhejiang University Sept.2022 – Present

Pianist and Tutor

- Provided structured piano lessons to fellow enthusiasts, performed in Steinway's special recording program and multiple concerts, and accompanied the freshmen choir on several art shows.
- Organized the annual Zhejiang University Concert, managing performance coordination, promotion, and logistics.