Hongzhi Zang

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Education

- **Tsinghua University** Beijing, China
  B.S. in Computer Science, GPA: 3.82/4.00 *2021-2025(expected)*

Experience

- **Carnegie Mellon University** Pittsburgh, USA
  Visiting Student. Robotics Institute. Advisor: Jiaoyang Li *March 2024-August 2024*

Skills Summary

- **Programming Languages**: Python, C++
- **Tools**: Git, github, Markdown, Pytorch, Latex, Linux, ROS
- **Language Skills**: **TOEFL MyBest score** R: 30, L: 30, S:23, W:26; Total: 109. **GRE(09/2024)** V: 157, Q: 170; Total: 327

Publications

Asterisks (*) indicate equal contribution.

- **Online Guidance Graph Optimization for Lifelong Multi-Agent Path Finding** accepted by AAAI2025
  Hongzhi Zang, Yulun Zhang*, He Jiang, Zhe Chen, Daniel Harabor, Peter S. Stuckey, Jiaoyang Li*
  arXiv: https://arxiv.org/abs/2411.16506
  - Design two pipelines to incorporate guidance policy with PIBT, a state-of-the-art rule-based MAPF algorithm.
  - Optimize a guidance policy to generate adaptive guidance.
  - Explore scenarios where task distribution changes over time, a challenging yet common situation in real-world applications.
  - Achieve up to 30.75% and 52.42% improvement in throughput for different baselines.

- **Multi-UAV Behavior-based Formation with Static and Dynamic Obstacles Avoidance via Reinforcement Learning** under review
  Yuqing Xie, Chao Yu*, **Hongzhi Zang***, Feng Gao, Wenhao Tang, Jingyi Huang, Jiayu Chen, Botian Xu, Yi Wu, Yu Wang*
  arXiv: https://arxiv.org/abs/2410.18495
  project site: https://sites.google.com/view/uav-formation-with-avoidance
  - Explore the challenging task of requiring drones to both maintain formation and avoid obstacles.
  - Design a two-stage training pipeline to enhance the policy performance.
  - Deploy our policy in the real world, achieving the highest success rate while maintaining proper formation.

Ongoing Research Projects

- **Improving Transparent Objects Grasping Performance Based on Tactile and Visual Information** Tsinghua University
  Instructor: Li Yi, Rui Chen; Collaborator: Junyu Chen, Yiran Yang, Zhihui Pan *September 2023-present*
  - Task: Combine vision and tactile information to grasp transparent objects.
  - Goal: Design a closed-loop grasping pipeline that contains tactile feedback, which can help the policy recover from failure cases.

Courses

- **Selected Courses**
  - **Major Courses**: Calculus A(1)(A), Machine learning(A), Game Theory(A), Deep Learning(A), AI+X Computing Acceleration: From Algorithms Development, Analysis, to Deployment(A), Natural Language Processing(A)
  - **Others**: Introduction to the Social Service of College Student(A), Writing and Communication(A), Appreciation and Practice of Dance($A+$)

- **Selected Course Projects**

  Custom Topology and Routing for ~~GPT~~ Matrix Multiplication August 2023
  - *AI+X Computing Acceleration*
    Instructor: Kaisheng Ma. Collaborator: Junyu Chen
    - Implement an on-chip network topology combining two binary trees with a multi-cast mechanism on the branches to accommodate the properties of matrix multiplication in simulation.
    - Outperform the Mesh baseline in terms of packet latency and reception ratio.
    - One of the excellent projects in the course.

  Wingardium Leviosa: Float Anything! May 2023
  - *Deep Learning*
    Instructor: Yi Wu. Collaborator: Junyu Chen, Kaifeng Lin
    - Propose the idea: An application that takes a photo as input and generates a video in which all objects appear to be floating in the air.
    - Implement the *inpainting* component of the whole pipeline.
    - Implement a user-friendly interface for easy interaction.
    - One of the most popular projects in the course.

  Create a 3D Model of Yourself : Interactive Structure from Motion June 2023
  - *Computer Vision*
    Instructor: Yang Gao. Collaborator: Junyu Chen
    - Implement a pipeline that generates a 3D point cloud of a person, excluding the background, from a series of photos.

Honors and Awards

- Excellent Social Work Scholarship *2022, 2023*
- Bronze Award, Tsinghua University Social Practice Excellent Team *2022*
- Dazhong Wang Scholarship (awarded to **top 1% of students** university-wide) *2024*
- 3rd Prize, 42nd The Challenge Cup Technological Innovation Competition at Tsinghua University *2024*