YuanHang Zhang

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EDUCATION

Carnegie Mellon University - School of Computer Science **Aug. 2024 – Present**
***Degree**: Master, **Major**: Robotic Systems and Development, **GPA**: 4.0/4.0* *Pittsburgh, the U.S.*

Shanghai Jiao Tong University (SJTU) **Sep. 2019 – Jun. 2023**
***Degree**: Bachelor, **Major**: Automation, **Major GPA**: 88.5/100* *Shanghai, China*
Honor: Outstanding Graduate (3%), Merit Student (3%)

SKILLS

Programming Languages: Python, C++, C, Java, HTML/CSS, Matlab
Tools/Frameworks: Pytorch, Mujoco, IsaacGym, Jax, ROS, Gazebo, Airsim, Casadi, Acados

RESEARCH EXPERIENCE

Learning to Catch Objects in Flight with Mobile Dexterous Hands **Feb. 2024 – Sep. 2024**
Research Assistant, Advisor: Prof. Huazhe Xu from Tsinghua University, China

- Constructed a mobile manipulator composed of a omni-wheeled base, a 6-DoF arm, and a 12-DoF dexterous hand, to catch diverse objects randomly thrown by humans with agility, accuracy and generalization.
- Proposed two-stage Reinforcement Learning framework to efficiently train a whole-control policy for our robot.
- Bridged the sim2real gap and deployed the policy trained in Mujoco onto the real robot in a zero-shot manner.

Multi-Agent Combinatorial Path Finding with Heterogeneous Task Duration **Aug. 2023 – Nov. 2023**
Research Intern, Advisor: Prof. Richard Ren from SJTU, China

- Proposed CBSS-TPG and CBSS-D to solve an unexplored multi-agent path finding problem with task duration.
- In CBSS-TPG, designed a post-process to generate a conflict-free path execution schedule with task duration.
- In CBSS-D, refined CBSS to guarantee solution optimality through taking task duration into sequence planning and improved searching efficiency by adopting new splitting rule while resolving conflicts.

Perception-constrained Visual Servoing Based NMPC for Quadrotor Flight **Mar. 2023 – Jun. 2023**
Undergraduate Thesis (A, top 3%) Advisor: Prof. Hesheng Wang from SJTU, China

- Proposed a Nonlinear Model Predictive Control (NMPC) method incorporating quadrotor and visual feature dynamics.
- Addressed perception-aware problems in Image-Based Visual Servo Control (IBVS) by adding visual feature constraints.
- Evaluated the control algorithm through traversal of multiple rings in Gazebo simulations and real drone experiments.

Federated Learning of Face Recognition on Mobile Devices **Apr. 2020 – Sept. 2021**
Undergraduate Research Program, Advisor: Prof. Fan Wu from SJTU, China

- Implemented facial recognition models on each mobile device and partitioned facial data for local training.
- Shared only model updates among edge devices and iteratively refined the global model with Federated Averaging.
- Deployed the refined federated facial recognition model on multiple mobile robots for Gosuncn Technology.

SELECTED PROJECTS

Zero-Shot Acrobatical Drone Flight with Imitation Learning | Python, C++ **Nov. 2023 – Dec. 2023**
Personal Project

- Utilized iterative imitation learning to train an acrobatic controller in simulation from a privileged MPC expert.
- Leveraged abstraction to represent visual features and bridged the gap between simulation and reality.

'AutoMaster': Learning-Based Multi-Model Fusion for Autonomous Driving | Python **Sept. 2021 – Jan. 2022**
*National Second Prize (**Top 5%**) in National University ICT Competition (Innovation Track)*

- Designed a distributed algorithm for data collection and alignment from multiple edge devices via Socket.
- Utilized the MindSpore framework to implement model integration of target detection and controlling.
- Deployed the combined model in a vehicle and achieved automated lane tracking and traffic responding

PUBLICATIONS

[1] **Y. Zhang***, T. Liang*, Z. Chen, Y. Ze, H. Xu. "Catch It! Learning to Catch in Flight with Mobile Dexterous Hands". ICRA 2025 [Website][arXiv][Code].
[2] **Y. Zhang**, X. Wu, H. Wang, Z. Ren. "Multi-Agent Combinatorial Path Finding with Heterogeneous Task Duration". arXiv 2024 [arXiv][Code].
[3] Y. Tian, S. Cheng, T. Wei, T. Zhou, **Y. Zhang**, Z. Liu, Z. Yuan, H. Xu. "ViTaS: Visual Tactile Soft Fusion Contrastive Learning for Reinforcement Learning". arXiv 2024.