YuanHang Zhang

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Education

Shanghai Jiao Tong University **Sep. 2019 – Jun. 2023**

***Major**: Automation **Overall Grade**: 88.5/100, **Junior Year Fall Semester Grade**: 92.5/100* *Shanghai, China*

- The SJTU Outstanding Graduate(top 10%), June 2023
- The SJTU Merit Student(top 3%), October 2021

Relevant Coursework

- Robotics(**A**)
- Mobile Robot(**A**)
- Pattern Recognition(**A**)
- Computer Vision(**A+**)
- Motion Control System(**A+**)
- Modern Control Theory(**A+**)

Research Experiences

Multiagent Target Sequencing Path Finding with Heterogeneous Task Duration **Aug. 2023 – Present**

Summer Intern Advisor: Dr. Zhongqiang Ren from CMU, the U.S.

- Proposed two conflict-based methods—CBSS-TPG and CBSS-D to solve the multiagent target sequencing path finding problem with target duration (MA-TS-PF, an unexplored multiagent path finding problem).
- Designed a post-process to generate a conflict-free path execution schedule in CBSS-TPG with task duration.
- 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 in CBSS-D.

Perception-constrained Visual Servoing Based NMPC for Quadrotor Flight **Mar. 2023 – Jun. 2023**

Undergraduate Project(A grade) Advisor: Prof. Hesheng Wang from SJTU, China

- Proposed a NMPC approach with quadrotor dynamics, incorporating visual constraints to address the Perception-Constrain problem in Image-Based Visual Servo Control (IBVS) for autonomous flight.
- Evaluated scheme's robustness through precise position tracking and smooth traversal of multiple rings in simulations and physical experiments.

Publications

Zhang Y, Ren Z. "Multiagent Target Sequencing Path Finding with Heterogeneous Task Duration," arXiv.

Projects

Drone Racing: Autonomous UAV Flight Traversing Multiple Rings | Leader **Sep. 2022 – Nov. 2022**

*National Third Prize(**Top 10%**) in UAV Intelligent Perception Technology Competition*

- Implemented SE(3) controller for quadrotor control within the PX4-Autopilot environment.
- Deployed YOLOv5 with TensorRT to accelerate object detection and implemented P3P for pose estimation.
- Utilized RAPIDDS to generate optimized and collision-free trajectories for quadrotor navigation.

'HarClass': A Smart Classroom Solution Based on Distributed System | Leader **Jun. 2022 – Sep. 2022**

*National First Prize & Harmony Innovation Award(**Top 1%**) in National University IOT Design Competition*

- Designed the 'HarClass', an App for modern smart classrooms, utilizing the distributed features of HarmonyOS.
- Leveraged BearPi for environment monitoring and formulated custom communication protocols for cloud connectivity.

'AutoMaster': Learning-Based Multi-Model Fusion for Autonomous Driving | Leader **Sep. 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 and Ascend chip to combine the model deployment of target detection and controlling for a higher efficiency.

AI-Based Automation System for Locomotion and Target Tracking | Leader **Mar. 2021 – Sep. 2021**

Developed for the VAIC Competition

- Designed a monocular vision method for in-field localization with a predefined field barcode, utilizing contour detection, fuzzy match algorithm and coordinate transformation.
- Leveraged YOLO-v3 algorithm for target detection and PID controlling for target tracking.

Extracurricular

SJTU VEX Robotics Club **Mar. 2020 – Jan. 2023**

Program Team Leader *Shanghai Jiao Tong University*

- Managed a team of 10+ undergraduates to develop algorithms for custom vehicle applications, achieving one of the highest program level among Chinese universities as well as winning lots of national champions(VEX-U track).

Miscellaneous

Programming Languages: C++, Python, Matlab, Java
Tools/Frameworks: ROS, OpenCV, Numpy, Pytorch, Tensorflow, Gazebo, Airsim
Languages: Mandarin(native), English(TOEFL-107 R30 L27 S22 W28)