Tianlin Zhang

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Education

Harbin Insitute of Technology, Shenzhen Sep 2021 - Mar 2024

M.S. Control Engineering

Advisor: Xiaogang Xiong

Changsha University of Science and Technology Sep 2017 - Jun 2021

B.E. Automation Engineering, Outstanding Undergraduate Graduates of Hunan Province

Advisor: Hui Zhang

Research Experience

Harbin Insitute of Technology, Shenzhen Sep 2021 - Present

Researcher, State Key Laboratory of Robotics and System Shenzhen, China

- Developed **qm_control** (code), a control framework for the quadruped manipulator based on model predictive control (MPC) and whole body control (WBC).
- Worked on fusing legged odometry and lidar-inertial odometry to build a legged SLAM framework (code).
- Worked on vision servo for the quadruped manipulator to track the dynamic target, and the result had been accepted by IROS2023.

Hunan University Sep 2019 - Jun 2021

Researcher, National Engineering Research Center of Robot Vision and Control Changsha, China

- Worked on 6-DoF pose estimation using deep learning, and implemented on the aerial manipulator to grasp targets (video).
- Worked on vision servo for the aerial manipulator to remove foreign objects on the power transmission line (video).

Publications

- **Tianlin Zhang**, Sikai Guo, Xiaogang Xiong, Wanlei Li, Zezheng Qi, and Yunjiang Lou. "Dynamic Object Tracking for Quadruped Manipulator with Spherical Image-Based Approach", *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)*, Accepted, 2023.
- Ling Li, **Tianlin Zhang**, Hang Zhong, Hongwen Li, Hui Zhang, Shaosheng Fan, and Yijia Cao. "Autonomous removing foreign objects for power transmission line by using a vision-guided unmanned aerial manipulator", *Journal of Intelligent & Robotic Systems* 103 (2021): 1-14.
- **Tianlin Zhang**, Hui Zhang, Hongwen Li, Hang Zhong, Xunhao Tang, and Yaonan Wang. "Catchit: Large-scale grasping combined with preliminary and precise localization method for aerial manipulator", *2020 Chinese Automation Congress (CAC)*. IEEE, 2020.

Awards

- 2019 "TI" Cup National Undergraduate Electronic Design Competition — First Prize of Hunan Province
  Lead the team to build a UAV that can track the target.
- 2019 "NXP" Cup National Undergraduate Smart Car Competition — Second Prize in South China Division
  Lead the team to build a racing SLAM car (video).
- 2019 Mathematical Contest In Modeling — Honorable Mention

Skills

Theory Robot Kinematics and Dynamics; Floating-Base Dynamics; Optimal Control; Model Predictive Control; Whole Body Control; Compliance Control; Vision Servo; Digital Image Processing; SLAM; Kalman Filter; Planning and Deep Learning.

Program C++/C, Python and Matlab.

Tools Expert on ROS1 and Gazebo; Frequently use Pinocchio to solve robot kinematics and dynamics; Frequently use OCS2 and QPOASES to build the optimal controller (e.g., MPC and WBC); Frequently use Opencv to process 2D image; Frequently use PCL to process 3D point cloud; Frequent use of Linux, Pytorch and Latex.

Robot Extensive development experience in legged robots, UAVs and mobile manipulators.