Tianlin Zhang

Phone: +8617638598672 | Email: skywoodszcn@gmail.com
WebSite: https://skywoodsz.github.io/

Education

Harbin Insitute of Technology, Shenzhen	Sep 2021 - Mar 2024

M.S. Control Engineering, **National Scholarship** (Top 0.2% in China), The First Prize Scholarship
Advisor: Prof. Xiaogang Xiong

Changsha University of Science and Technology	Sep 2017 - Jun 2021

B.E. Automation Engineering, Outstanding Graduates Awards of Hunan Province (top 2% in Hunan), Rank within the Top 1%.
Core Courses: Automatic Control System (100), Advanced Mathematics (97), Analog Electronic Techniques (97), Circuit Theory (96), Principles of Electrical Machinery & Towage (95), Digital Signal Processing (94), Linear Algebra (90)
Advisor: Prof. Hui Zhang

Research Experience

Harbin Insitute of Technology, Shenzhen	Sep 2021 - Present
Research Assistant, 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 was accepted by IROS2023.
- Worked on the whole-body complaint control with torque saturation for the quadruped manipulator, and the result is under the review of RA-L (video).

Hunan University	Sep 2019 - Jun 2021
Research Assistant, 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

M.S.

- **Tianlin Zhang**, Xuanbin Peng, Sikai Guo, Xiaogang Xiong, Yang Bai, Ke Li and Yunjiang Lou. "Whole-body Compliant Control for Quadruped Manipulator with Torque Saturation", *IEEE Robotics and Automation Letters* (*RA-L*), Under review.
- **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.

B.E.

- 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; Compliant Control; Visual Servoing; 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 experience with legged robots, UAVs, and mobile manipulators.