

Tianlin Zhang

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Education

Harbin Institute of Technology, Shenzhen

Sep 2021 - Mar 2024

MA.Eng., Control Engineering, The First Prize Scholarship

GPA: 3.4/4.0; Ranking: 4/54

Advisor: [Prof. Xiaogang Xiong](#)

Changsha University of Science and Technology

Sep 2017 - Jun 2021

B.Eng., 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 & Towing (95), Digital Signal Processing (94), Linear Algebra (90)

Advisor: [Prof. Hui Zhang](#)

Research Experience

Harbin Institute 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 quadruped manipulators 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 quadruped manipulators to track dynamic targets, and the result was accepted by IROS2023 ([video](#)).
- Worked on the whole-body compliance control with actuation saturation for quadruped manipulators, and the result is under the review of IROS2024 ([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 it to aerial manipulators to grasp targets ([video](#)).
- Worked on vision servo for aerial manipulators to remove foreign objects on the power transmission line ([video](#)).

Publications

MA.Eng.

- T. Zhang**, F. Lin, X. Peng, X. Xiong, and Y. Lou, "Whole-body Compliance Control for Quadruped Manipulator with Actuation Saturation of Joint Torque and Ground Friction", 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Under review.
- T. Zhang**, S. Guo, X. Xiong, W. Li, Z. Qi and Y. Lou, "Dynamic Object Tracking for Quadruped Manipulator with Spherical Image-Based Approach," 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, USA, 2023, pp. 727-734, doi: 10.1109/IROS55552.2023.10341608.

B.Eng.

- L. Li, **T. Zhang**, H. Zhong, H. Li, H. Zhang, S. Fan, and Y. 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.
- T. Zhang**, H. Zhang, H. Li, H. Zhong, X. Tang, and Y. Wang, "CatchIt: Large-scale Grasping combined with Preliminary and Precise Localization Method for Aerial Manipulator," 2020 Chinese Automation Congress (CAC). IEEE, 2020.

Awards

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|---|--------------------------------------|
| • 2019 "TI" Cup National Undergraduate Electronic Design Competition
<i>Lead the team to build a UAV that can track the target.</i> | First Prize of Hunan Province |
| • 2019 "NXP" Cup National Undergraduate Smart Car Competition
<i>Lead the team to build a racing SLAM car (video).</i> | Second Prize in South China Division |
| • 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; Visual Servoing; SLAM; Motion 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.