Chuye Zhang

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Education

Southern University of Science and Technology *Sep 2021 - July 2025*
Bachelor in Robotics Engineering

- GPA: **3.88/4.0**,
- Rank: **1/67**

University of Pennsylvania *Jan 2024 - May 2024*
International Guest Student

- GPA: 4.0/4.0

Georgia Institute of Technology *Aug 2025 - Present*
Master of Science in Robotics

Research Experience

Task-Agnostic Pose Estimation in Robotic Table-top Manipulation *SUSTech CLEAR Lab*
CoRL 2025 *Sep 2024 – Aug 2025*

- Designed and implemented a decoupled two-stage framework for closed-loop robotic manipulation
- Achieved an average success rate of 83.0% on LIBERO-Spatial, LIBERO-Object, and LIBERO-Goal, outperforming the previous video pretraining SOTA by 11.56%
- Reached a 79.4% average success rate across 8 tasks in LIBERO-90, surpassing the video-prediction baseline Grounding V2A by 26.9%
- Reduced reliance on action-labeled data, matching prior SOTA ATM with only 20% of demonstrations and no action labels
- Implemented a ROS-based control stack with IK and motion smoothing; realized real-time closed-loop rates (video planning ∼1.6 Hz, pose estimation ∼43.5 Hz) on an ARX-5 manipulator
- Led all real-world experiments and demonstrated that human-manipulation video pre-training consistently improved performance, resulting in a 30% boost in real-world success
- Designed a cross-attention RGB–Depth ViT pose estimator and conducted ablations showing it outperforms ResNet/ViT baselines; used depth-CLS queries over RGB tokens
- Integrated monocular depth estimation into the pipeline, producing an additional 6.78% performance gain

Collaborative Interface for Language Model Powered Robots *UPenn GRASP Lab*
RSS workshop 2024 *Apr 2024-July 2024*

- Designed prompts and ROS nodes that map LLM semantic actions to 6-DoF Dynamical System (DS) commands via a bidirectional dictionary, enabling real-time robot control
- Designed and conducted a proof-of-concept experiment to statistically evaluate the success rate of proper decisions made by our system
- Demonstrated in-context "memory" of human corrections by the LLM: when the same state reappeared, the corrected action was recalled with 85% success at 10 steps ago, and 80% at 15 steps ago
- Designed a friction-based self-locking mounting mechanism, enabling effective grasping
- Deployed the full pipeline on a 7-DoF KUKA LBR iiwa-14 in a hybrid real + sim setup (OptiTrack for human hands; Gazebo digital twin), using GPT-4o for decision making
- Recorded and organized experimental data, visualized results, and created publication-quality illustrations. Prepared materials for the poster session at the Generative Modeling meets HRI - RSS'24 Workshop

Overconstrained Robot Locomotion *SUSTech BionicDL Lab*
IEEE ReMAR 2024 *Apr 2023-Feb 2024*

- Designed and prototyped an overconstrained quadruped robot for earthquake sensor retrieval using Fusion 360, earning first prize in a national mechanical design competition

- Established a simulation environment in Isaac Gym to replicate reinforcement learning for a quadruped robot
- Achieved the highest flat-terrain speed with Bennett limbs (0.85 m/s), 20% higher than traditional planar limbs
- Addressed the overconstrained leg simulation issue by identifying equivalent open-loop mechanisms and simplifying the design for the competition, importing the URDF file into the simulation environment
- Refined reward functions, and optimized hyperparameters
- Analyzed simulation data to calculate locomotion energy efficiency, visualized results, and conducted comparative analysis
- Delivered an online presentation at the ReMAR 2024 conference held in Chicago

Mapping, Tracking, and Navigating in Unbounded Urban Environments *SUSTech CLEAR Lab*
Journal of Field Robotics *Jul 2022-May 2023*

- Developed a Kalman filter–based approach to integrate biased SLAM odometry with unbiased but noisy compass data, achieving accurate estimation of the robot's yaw (heading) angle with 9.44% error
- Improved yaw angle estimation by fusing GPS data with SLAM odometry through an optimization-based approach, reducing error to 0.045%
- Conducted extensive real-world hardware tests to validate the algorithm's performance across diverse scenarios
- Planned experimental routes using the Baidu Maps API
- Deployed ROS for multi-robot communication, enabling real-time visualization and monitoring of experimental data
- Recorded and organized experimental videos and datasets

Publications

- **Chuye Zhang***, Xiaoxiong* Zhang, Linfang Zheng, Wei Pan, Wei Zhang, Generative Visual Foresight Meets Task-Agnostic Pose Estimation in Robotic Table-top Manipulation, CoRL September 27 - 30 2025, Seoul, Korea, https://arxiv.org/abs/2509.00361
- **Chuye Zhang***, Yifei Simon Shao*, Harshil Parekh, Junyao Shi, Pratik Chaudhari, Vijay Kumar, Nadia Figueroa, Don't Yell at Your Robot: Physical Correction as the Collaborative Interface for Language Model Powered Robots, Generative Modeling meets HRI - RSS'24 Workshop, https://arxiv.org/abs/2412.12602
- Yenan Chen#, **Chuye Zhang**#, Pengxi Gu#, Jianuo Qiu, Jiayi Yin, Nuofan Qiu, Guojing Huang, Bangchao Huang, Zishang Zhang, Hui Deng, Wei Zhang, Fang Wan*, and Chaoyang Song* (2024). "Evolutionary Morphology Towards Overconstrained Locomotion via Large-Scale, Multi-Terrain Deep Reinforcement Learning." IEEE/IFToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR2024). Chicago, USA, 24-27 June 2024, https://arxiv.org/abs/2407.01050
- Tingxiang Fan, Bowen Shen, Yinqiang Zhang, **Chuye Zhang**, Lei Yang, Hua Chen, Wei Zhang, Jia Pan, S2MAT: Simultaneous and Self-Reinforced Mapping and Tracking in Dynamic Urban Scenariosorcing Framework for Simultaneous Mapping and Tracking in Unbounded Urban Environments (First Revision Submitted to Journal of Field Robotics on November 7, 2024), https://arxiv.org/abs/2304.14356

Selected Awards

Outstanding Undergraduate Thesis Award, SUSTech MEE Department	2025
Outstanding Student Scholarship for the 2022-2023 Academic Year, SUSTech	2023
Outstanding Student Scholarship for the 2021-2022 Academic Year, SUSTech	2022
First Prize in Mechanical Product Digital Design Competition	2023
Advanced Individual in Alma Mater Revisiting Program	2022