Chuye Zhang

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EDUCATION BACKGROUND

University of Pennsylvania Jan 2024-Jul 2024
International Guest Student | GPA: **4.0/4.0**

Southern University of Science and Technology (SUSTech) Sep 2021-Present
Bachelor of Engineering in ***Robotics Engineering*** | GPA: **3.87/4.0**, Rank: **1/67**

PUBLICATIONS

- **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,
- 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.
- 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 *(submitted)*

PROFESSIONAL SKILLS

Programming Languages: Python, Java, MATLAB, C/C++
Software & Tools: Robot Operating System (ROS)**,** Linux (Ubuntu), SolidWorks, LaTeX, Fusion 360**,** CapCut, Adobe Premiere
Robotics: Classic ML/Deep Learning**,** Classic Machine Perception, Mechanical Design, Mobile Robotics, Mechatronics, compass and IMU

RESEARCH EXPERIENCE

Don't Yell at Your Robot: Physical Correction as the Collaborative Interface for Language Model Powered Robots *https://sites.google.com/sas.upenn.edu/dontyellatyourrobot/home*
Core Member, Co-first Author | *Advisor: Nadia Figueroa (UPenn Grasp Lab)* Apr 2024-July 2024

- Developed and optimized prompts to enable the large language model (LLM) to interact effectively with our robotic system and environment.
- Designed and conducted a Proof-of-Concept Experiment and implemented an experiment to statistically evaluate the success rate of LLM outputs, validating the feasibility of prompt-space corrections to improve model conclusions.
- Created a mount mechanism using friction self-locking principles and transformed simple robotic arm grasping tasks into rotational operations.
- Deployed the algorithmic on the 7DOF KUKA14 robotic arm, and ensured it executed LLM-generated inputs and accurately responded to human physical interactions.

Evolutionary Morphology Towards Overconstrained Locomotion via Large-Scale, Multi-Terrain Deep Reinforcement Learning *https://ancorasir.github.io/BennettWheelLegRL/* Apr 2023-Feb 2024

Core Member, Co-first Author | *Advisor: Chaoyang Song (SUSTech Biontic Design & Learning lab)*

- Researched market on robotic application scenarios, designed and verified prototypes using CAD software, based on which won the first prize in a national mechanical design competition.
- Established a robot simulation environment on the laboratory server using Isaac Gym, which included installing GPU drivers and relevant dependencies, and then reproduced the reinforcement learning process of a quadruped robot within Isaac Gym.
- Trained parts of the model, adjusted and tested reward functions, and fine-tuned hyperparameters such as learning rates.
- Extracted data from the Isaac Gym environment to calculate the unit energy consumption of locomotion, created corresponding visualizations and conducted comparative data analysis.

Simultaneous and Self-Reinforced Mapping and Tracking in Dynamic Urban Scenariosorcing Framework for Simultaneous Mapping and Tracking in Unbounded Urban Environments
https://sites.google.com/view/smat-nav Jul 2022-May 2023

Core Member, The Third Author | *Advisor: Professor Wei Zhang, SUSTech CLEAR Lab*

- Utilized Kalman filtering to integrate SLAM with compass data and combined unbiased and biased data to achieve an optimal estimation of the robot's yaw angle (heading).
- Optimized the robot's yaw angle estimation by fusing GPS data with SLAM outputs and compared with compass-integrated data.
- Designed an algorithm to rapidly initialize and align the robot with the map using the fusion mentioned above methods, and tested and validated the algorithm in real-world scenarios using Baidu Maps API for route selection.
- Deployed ROS for multi-robot communication, ensured real-time visualization and monitored experimental data.

EXTRACURRICULAR ACTIVITIES

Class Representative of the 2021 Robotics Engineering Class, Department of Mechanical and Energy Engineering, SUSTech Sep 2022-Now
Graduation Ceremony Volunteer, Department of Mechanical and Energy Engineering, SUSTech Jun 2022
Freshman Orientation Volunteer Activities, SUSTech Sep 2021

HONORS AND AWARDS

Outstanding Student Scholarship of 2022-2023 Academic Year, SUSTech 2023
Outstanding Student Scholarship of 2021-2022 Academic Year, SUSTech 2022
First Prize in Mechanical Product Digital Design Competition 2023
Global Engineer Talent Research and Innovation Summer School 2023
Successful Participant, Interdisciplinary Contest in Modeling 2023
Shuli College Enthusiastic Participation Award Scholarship 2021-2022
The Advanced Individual in Alma Mater Revisiting Program 2022
Member of the College Basketball Team, SUSTech 2021-2022
First Place in Class Basketball Tournament, SUSTech 2022