

JIAHE XU

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EDUCATION

M.S, Robotics
Johns Hopkins University, Baltimore, MD
B.S, Computer Science
Jilin University, Changchun, China

GPA:3.8/4.0 Aug 2020 - May 2022

GPA:3.6/4.0 Sep 2016 - Jun 2020

WORK EXPERIENCE

System Engineer - Carnegie Mellon University Oct 2022 - now
Air Lab(with Prof. Sebastian Scherer), CMU, Pittsburgh, PA

- Integrated lab's SLAM systems (MSO(multi-spectral), VIO, LIO) into Jetson platforms and improved the code's efficiency with tools such as VPI, tensorRT.
- Thermal camera and FOV camera calibration: improved Kalibr's corner detection method and mitigated the reprojection error from 2.5 pixels into 1 pixel.
- Sensor and signal specialist: (calibration and time sync on Stereo, Depth Camera, Gimbal, LIDAR, IMU with CANBUS, I2C, SPI)
- Deployed VLMs on real-robot for robot decision-making and injury assessment.
- Use iPhone and VisionPro as sensor packs (convert ARKit and Raw Camera output to ROS2 messages in embedded devices).
- High-level system architecture designer of DARPA DTC challenge of CMU CHIRON team.
- Video streaming and acceleration on Doodle Radio (DDS acceleration and video encoding using Gstreamer Pipeline and Nvidia NVMEM and encoders)

Research Assistant - Carnegie Mellon University June 2024 - now
(with Prof. Katerina Fragkiadaki), CMU, Pittsburgh, PA

- Mobile aloha improvement and calibration(synced high-resolution RGBD cameras, robot calibration, etc).
- Implement a real2sim pipeline for object-centric methods (Image to mesh, mesh rescaling, and rigid body object tracking).
- Use diffusion model for bi-manual manipulation tasks (bi-manual version 3DDA)
- large-scale data collection and data management (record multiple HD stereo RGBD cameras in real time)
- Use collected data for real-to-sim improvement for RL algorithms (ongoing)
- Real-Robot long horizon task planning in 3D environment using ViLM and VLM (on going).
- Implement a hand tracking and retargeting system for robot control in Isaac Gym.
- Using stereo cameras with a learning-based method for depth estimation to replace azure-kinect.
- Built and improved the Aloha2 system with synced cameras and sensors for data collection
- System calibration (cameras, hand-eye, forward kinematics), narrowed error from 3cm to 3mm.

PROFESSIONAL SKILLS

- Proficiency in C, C++, Python, Matlab.
- Experience with Pytorch, ROS, TensorRT, Ceres, Eigen, VPI, Docker, and Jetson platform.

- Knowledge in CUDA programming, multi-threading, SIMD, CI/CD, Pixhawk.

PUBLICATION

- Chen Wang, Dasong Gao, Kuan Xu, Junyi Geng, Yaoyu Hu, Yuheng Qiu, Bowen Li, Fan Yang, Brady Moon, Abhinav Pandey, Aryan, Jiahe Xu, Tianhao Wu, Haonan He, Daning Huang, Zhongqiang Ren, Shibo Zhao, Taimeng Fu, Pranay Reddy, Xiao Lin, Wenshan Wang, Jingnan Shi, Rajat Talak, Kun Cao, Yi Du, Han Wang, Huai Yu, Shanzhao Wang, Siyu Chen, Ananth Kashyap, Rohan Bandaru, Karthik Dantu, Jiajun Wu, Lihua Xie, Luca Carlone, Marco Hutter, and Sebastian Scherer. Pypose: A library for robot learning with physics-based optimization. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 22024–22034, June 2023
- Xiaofeng Guo, Guanqi He, Jiahe Xu, Mohammadreza Mousaei, Junyi Geng, Sebastian Scherer, and Guanya Shi. Flying calligrapher: Contact-aware motion and force planning and control for aerial manipulation. *IEEE Robotics and Automation Letters*, 9(12):11194–11201, 2024

AWARDS

Medal winner in International Collegiate Programming Contest (ICPC), an international programming contest.

- The 2017 ACM-ICPC Asia Regional Contest Bronze Medal.
- The 2016 ACM-ICPC Asia Regional Contest Bronze Medal.