Zhouhao Zhang

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Education

Beihang University Sep 2020 – Jun 2024
Bachelor of Engineering in Automation (GPA: 3.80 / 4.00) *Beijing*

Internship

Zhipu AI X-lab Jun 2024 – Present
Research Intern *Beijing*

- Deployed RGBD SLAM algorithm RTABMAP on Unitree Go2 quadruped with Orbbec depth camera

Skyforce Technology Jul 2023 – Dec 2023
Intern R&D Engineer *Shenzhen*

- National Invention Patent (Pending): Automatic keystone correction for projectors based on structured light
- Implemented structured light system calibration using Gray code and local homography
- Developed automatic keystone correction algorithm for projectors using TOF and IMU sensors
- Developed automatic obstacle avoidance scheme for projectors using LiDAR and RANSAC algorithm

Honors

National Scholarship | *Top 3 out of 236, The Ministry of Education of the People's Republic of China* Dec 2022
First Prize, 23rd China University Robot Competition (ROBOCON, Third place in China) Jul 2024
Second Prize, 23rd China University Robot Competition (RoboMaster) Apr 2024
Second Prize, 22nd China University Robot Competition (ROBOCON) Jul 2023
First Prize, 2022 Five Provinces of North China University Robot Competition Nov 2022
First Prize, 2022 Beijing University Robot Competition Nov 2022
Second Prize, China Intelligent Robot Fighting and Gaming Competition Mar 2023
Third Prize, 38th National College Physics Competition Dec 2021
Outstanding Graduate Award | *Beihang University* Jun 2024
CATIC Scholarship | *Total 10 Places in Beihang University* Dec 2023
First Prize, Scholarship in Discipline Competition | *Beihang University* Nov 2023
Second Prize, Scholarship in Outstanding Social Work | *Beihang University* Nov 2023
Outstanding Student Leader | *Beihang University* Nov 2023
Top Prize, Learning Excellence Scholarship | *Top 3 out of 154, Beihang University* Dec 2022
Outstanding Student | *Top 2 out of 154, Beihang University* Sep 2022
Third Prize, 32nd FengRu Cup Competition & Yuyuan Robots Competition | *Beihang University* Jun 2022

Projects

MedAIR, Chinese University of Hong Kong Dec 2023 – Jun 2024
Graduation Project (Remote), Guided by Prof. Qi Dou

- Task automation of 7DOF da Vinci surgical robots via demonstration-guided RL and policy chain
- Surgical robot visual manipulation policy learning via world model-based reinforcement learning
- High-level task planning of robot based on large language models and task tree

BioSoft Robotics Lab, Beihang University Apr 2023 – Oct 2023
Research Member, Guided by Dr. Lei Li

- Publication: An aerial-aquatic hitchhiking robot with remora-inspired tactile sensors and thrust vectoring units, in Advanced Intelligent Systems, DOI: 10.1002/aisy.202300381
- Flight control program debugging and SLAM algorithm deployment of cross-media UAV

Pattern Recognition & Image Processing Course Project, Beihang University Dec 2023
Project Leader

- Segmentation of medical images of liver and fundus vessels based on U-net
- Image stitching based on Scale Invariant Feature Transform feature matching
- Grasp position detection for electronic components based on vision transformer
- Mixture Gaussian model of population constructed by Expectation-Maximization algorithm

BR Robotics Team, Beihang University Aug 2022 – Jun 2024

Member & Coach

- Visual auto-shoot algorithm based on YOLO and localization prior for racing robot in CURC ROBOCON 2023
- Decision making algorithm based on minimax search for racing robot in CURC ROBOCON 2024
- Point cloud classification and part segmentation using PointNet, PointNet ++
- Deployment of SLAM algorithms: Vins-Mono/Vins-Fusion, RTABMAP, ORB-SLAM, FAST-LIO2
- Camera pose estimation based on PNP algorithm and morphological operation
- Robot path planning based on A-star algorithm and grid map
- Technical guidance for the RoboMaster, ROBOCON and RoboCup competitions
- Construction work of the first RoboMaster team of Beihang University

Extracurricular Experience

Red Bird Challenge Camp Jun 2024

Hong Kong University of Science and Technology (Guangzhou) *Guangzhou*

- Built a factory simulation environment in Gazebo for intelligent mobile detection robot simulation
- Implemented SLAM for the mobile detection robot using the Cartographer algorithm
- Implemented autonomous navigation and dynamic obstacle avoidance for the robot using ROS move base package

Artificial Intelligence & Machine Learning Program Aug 2023

National University of Singapore *Singapore*

- Developed a novel Seq2Seq method for population forecasting using LSTM
- Won the final presentation, receiving praise from Prof. Mehul Motani

Skills

Languages: Chinese (native), English (TOEFL: 93)
Programming Languages: Python, C, C++
Robot Development Environments: Linux, ROS, ROS2, Gazebo, PyBullet, MATLAB
Development Libraries: Pytorch, OpenCV, OpenAI Gym, PCL, Eigen
Robot Sensors Experiences: LiDAR, Structured Light Camera, Stereo Camera, IMU, TOF