Xuyang Zhao

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EDUCATION

Beijing Institute of Technology (BIT) Beijing, China
M.Sc. in Control Engineering; **Grade: 85.26/100** *Sep 2021 − Jun 2024 (Expected)*
Lab: State Key Lab of Autonomous Intelligent Unmanned Systems   **Advisor:** Prof. Chengpu Yu

China University of Mining & Technology (CUMT) Beijing, China
B.Eng. in Measurement and Control Technology; **Grade: 88.52/100** *Sep 2017 − Jun 2021*
Outstanding Graduates (Top 5%);   Excellent Bachelor Thesis First Price (Top 1%)

INTERESTS

Enhancing the Autonomy of Robotics. Currently focusing on *Autonomous Exploration* and its supporting technologies (*SLAM*, *Motion Planning*, and *Multi-robot Collaboration*).

PUBLICATIONS

TDLE: 2-D LiDAR Exploration With Hierarchical Planning Using Regional Division
***Xuyang Zhao**, Chengpu Yu, Erpei Xu, Yixuan Liu* *IEEE CASE 2023 (Accepted)*
- Proposed an exploration system which can run at high frequencies (>100Hz) on low-power edge platforms, while offering up to significant efficiency improvement. *[Paper](#) | [Code](#) | [Video](#)*

DOTF-SLAM: Real-time Dynamic SLAM Using Object Tracking and Key-point Filtering
*Yixuan Liu, **Xuyang Zhao**, Zhengmao Liu, Chengpu Yu* *IEEE ICUS 2023 (Accepted)*
- Eliminate dynamic feature points while retaining static points of movable objects to improve robustness. The localization accuracy is improved by up to 21.69% compared with ORB-SLAM in the KITTI dataset.

PATENTS

[1] Chengpu Yu, **Xuyang Zhao**, Dajian Zhou, **"An Indoor Mapping Method And Device With Autonomous Exploration"**, Chinese Patent 202111141092.1, 2021.

[2] Chengpu Yu, **Xuyang Zhao**, Yixuan Liu, **"A Lidar Exploration and Mapping Method Based on Regional Segmentation"**, Chinese Patent 202321893269.1, 2023.

[3] Chengpu Yu, Dajian Zhou, **Xuyang Zhao**, **"An 3D Inversion Positioning Method Based on Ultra-wideband (UWB)"**, Chinese Patent 202110893866.X, 2021.

RESEARCH EXPERIENCE

Indoor Navigation and Detection Based on Air-Ground Platform Collaboration *[Code](#) | [Video](#)*
National Key R&D Program *Oct. 2021 − Now*
- Developed a LiDAR exploration system which can conduct indoor surveys, helping to inspect the internal environment and find trapped people in disaster relief scenarios.
- The whole process requires no remote control or pre-specified routes, as the decision is made entirely by the on-board processing unit and drones can return autonomously after completion.

Collaborative Perception and Environment Modeling of Unmanned Swarms
Industry-Academia Collaborative Innovation Fund *Jul. 2022 − Now*
- Built an unmanned swarm that support any number of intelligent agents for efficient collaborative exploration.
- Built small drones from scratch, established UDP communication to exchange custom compact messages, and designed a scalable dynamic task allocation strategy.

Intelligent Car Racing Competition

China's 15th National Collegiate Smart Car Race *May 2020 − Sept. 2020*

- Besides device adjustment and tuning, we (1) Correct the distortion of LiDAR scans; (2) Add strong constraints for obstacle avoidance in local planner; (3) Construction of LiDAR-IMU fusion odometry.
- Successfully advanced in the simulation competition of the North China division and subsequently won the National Second Prize in the final race.

WORK EXPERIENCE

Phigent Robotics *phigent.ai*

Autonomous Driving R&D Intern *April 2023 − May 2023*

- Build a simulation platform with Carla and OpenDDS to access LiDAR sensing and post-processing algorithms for prototype testing.

SKILLS

Extensive experience in Mobile Robots/Drones(UAVs) development, both software and hardware.

Robotics Dev.: ROS, PX4, Gazebo, PCL, Eigen, Ceres, etc.

Programming: C/C++, Python, Matlab

Dev. Tools: Git, Linux & Shell, Docker, etc.

Language: English (TOEFL: 101, CET-6: 551), Chinese (Native)