Mike Xiangyu Liu

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EDUCATION

University of Illinois Urbana-Champaign
- MS. in Aerospace Engineering (Control & Dynamic Systems) Aug 2022 – now

Nanyang Technological University (NTU), Singapore
- M.Sc. in Computer Control and Automation Aug 2018 – Jun 2019
  - Dissertation: Quantitative Trajectory Evaluation Criterion and Long-term Enhancement for Multi-Robot SLAM[3]
  - Adviser: Prof. Danwei Wang
  - Focus: Multi-Robot SLAM, Computer Vision
  - Cumulative GPA: 3.88 / 5.0

University of Electronic Science and Technology of China (UESTC), Chengdu, Sichuan, P.R.China
- B.Mgt. in Electronic Commerce Sep 2014 – Jun 2018
- B.Eng. in Electronic Engineering
  - Dissertation: Research on Organizational Attraction of JD.COM in the era of Smart Logistics [2]
  - Recommended Postgraduate Qualification
  - Cumulative GPA: 3.47 / 4.00

SKILLS

- C/C++, Linux, ROS, Python and Matlab.
- Robotics Perception and Navigation, Reinforcement Learning.
- Practical skills on mechanical and electronic design for robotics, and abundant hands-on experience in robot development.

WORK EXPERIENCE

Deka Research and Development Corp., Manchester, NH
- Software Engineer Intern (Path Planning) May 2023 – Aug 2023

Nanyang Technological University, Singapore
- Research Associate, Robotic Lab Jul 2021 – Jul 2022
  - Supervisor: Prof. Danwei Wang

Zhejiang University, Hangzhou, China
- Research Assistant, State Key Lab of CAD&CG, College of Computer Science Jul 2020 – Apr 2021
  - CAD&CG: Computer Aided Design and Computer Graphics
  - Project: Multi Robot Collaborative SLAM
  - Supervisors: Prof. Guofeng Zhang

AWARDS & SCHOLARSHIPS

IROS21 Best Paper Finalist, Prague, Czech
- Coxgraph: Multi-robot collaborative, globally consistent, online dense reconstruction system. [4]

National First Award, in National University Electronics Design Contest (NUEDC), MoE China
- For contest project: panel-ball controlling device Aug 2017

National Champion, in RoboMasters National University Robot Contest, MoE China & DJI
- For contest project: RM series robots.[1] Oct 2015 – Aug 2016

PROJECTS

Computer Vision Group, State Key Lab of CAD&CG, Zhejiang University
- Research Assistant Jul 2020 – Apr 2021
  - Project: Multi Robot Localization, Reconstruction and Exploration [4] (**First Author, IROS 2021 Best Paper Award Finalist on Safety, Security, and Rescue Robotics in memory of Motohiro Kisoi**).
  - Brief: We are exploring and pushing the limit of multi robot dense reconstruction and navigation system with higher performance on mapping and functionality of complicated exploration and searching task. By integrating recent multi robot localization and optimization methods, and bringing in a new map compression algorithm, my paper proposes a new system able to build dense map with global consistency, robustness and work under less than 100 KB/s of bandwidth.
  - Supervisors: Prof. Guofeng Zhang
  - Focus: Multi-Robot SLAM, Cross-Robot Localization, Dense Reconstruction, Navigation

Robotics Lab, Nanyang Technological University, Singapore
- Research Associate Jul 2021 – Jul 2022
  - Project 1: AESV: Autonomous Environmental Service Vehicle

- Brief: Cooperating with major network providers, tourist sights and multiply client companies, we are building the next-generation vehicle teleoperation platform. With our partners providing island-wide 5G network and vehicles, our platform is able to teleoperate vehicles across the island, with low-latency image and 3D map transmission, even real-time force feedback. We are exploring different application scenarios and vehicles for our teleoperation technology, and standardize our platform and its installation process on vehicle.
- Project 2: Distributed LiDAR: low-cost full-angle obstacle detection sensor module.
- Brief: The most common way to achieve full-angle obstacle detection is to mount lidar or several depth cameras, which turn to be less cost-effective and require high computation resources. This project is aimed at development of new sensor modules catering users' demand of cheap, light-weight and flexible solution to obstacle detection. Several modules are already ready-to-ship. One module with flexible design can adhere to desired surfaces. One module with optical fibre conducting light, of which 32 fibres can be embedded in UAV propeller protectors. This project has international patents in several countries.

JD.COM X Department, JD.COM

- Internship, Embedded Algorithm Engineer — Sep 2017 – Dec 2017
  - Project: Auto-Warehouse AGV
  - Work: Joined the R&D group of auto-warehouse AGVs, help to design and debug AGVs for smart logistic application. Our group in JD X department was responsible for developing, maintaining and upgrading our JDX auto-warehouse AGVs, which are successfully deployed in JD warehouses in several major cities in China.
  - Focus: Smart Logistics, AGV.

LANGUAGES

- Chinese: Native speaker.
- English: Fluent (IELTS: 8(7)).

REFERENCES

- **Dr Danwei WANG, Professor**
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  Nanyang Technological University, Nanyang Avenue, Singapore 639798
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  School fax: (+65) 6793 3318
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  WWW: http://www.ntu.edu.sg/home/edwwang
- **Dr Guofeng ZHANG, Professor**
  Computer Vision Group, State Key Lab of CAD&CG
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  School fax: (+86) 571-88206680
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- **Dr Zhaopeng Cui, Research Professor**
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  WWW: https://zhpcui.github.io/

PUBLICATIONS

[1]Yijie Qu, **Xiangyu Liu**, and JiaXiang Xu. Patent: A uav-mounted lightweight grabbing device. *Patent No. CN201710174508.7*, 2016.

[2]**Xiangyu Liu**. Research on organizational attraction of jd.com in the era of smart logistics (only in chinese). Bechalor Thesis, University of Eletronic Science and Technology of China, 10.13140/RG.2.2.34092.69760, 2018.

[3]**Xiangyu Liu**. Quantitative trajectory evaluation criterion and long-term enhancement for multi-robot slam. Master's thesis, Nanyang Technological University Singapore, 10.13140/RG.2.2.14698.88002, 2019.

[4]**Xiangyu Liu**, Weicai Ye, Chaoran Tian, Zhaopeng Cui, Guofeng Zhang, and Hujun Bao. Coxgraph: Multi-robot collaborative, globally consistent, online dense reconstruction system. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021. Best Paper Award Finalist on Safety, Security, and Rescue Robotics.