

# LIU Hongji

Robotics and Multiperception Lab (Intelligent Autonomous Driving Center)  
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## EDUCATION

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**The Hong Kong University of Science and Technology, Hong Kong SAR, China**

2020 - present

*Ph.D. in Robotics & Autonomous Systems*

Advisors: Prof. Ming Liu & Prof. Qifeng Chen

**Sun Yat-sen University**

2015 - 2019

*B.Eng in Software Engineering*

GPA: 3.8/5 Advisor: Prof. Hui Cheng

## PUBLICATIONS

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### Journal Publications

2. **VHDMaP-SE: A Universal Vectorized High-definition Map Aided Vehicle State Estimator**

Hongji Liu, Mingkai Tang, Mingkai Jia, Yingbing Chen, Jin Wu, and Ming Liu.

*IEEE Transactions on Intelligent Vehicles (T-IV)*, 2024.

1. **IR-STP: Enhancing Autonomous Driving With Interaction Reasoning in Spatio-Temporal Planning**

Yingbing Chen, Jie Cheng, Lu Gan, Sheng Wang, Hongji Liu, Xiaodong Mei, and Ming Liu

*IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2024.

### Conference Publications

2. **PGO-IPM: Enhance IPM Accuracy with Pose-guided Optimization for Low-cost High-definition Angular Marking Map Generation**

Hongji Liu, Linwei Zheng, Xiaoyang Yan, Zhenhua Xu, Bohuan Xue, Yang Yu, and Ming Liu.

*35th IEEE Intelligent Vehicles Symposium (IV)*, 2024.

1. **360ST-Mapping: An Online Semantics-Guided Topological Mapping Module for Omnidirectional Visual SLAM.**

Hongji Liu, Huajian Huang, Sai-Kit Yeung and Ming Liu.

*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022

## PATENTS

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1. **Multi sensor device and joint data acquisition component.**

Hongji Liu, Hexiang Wei, Xupeng Xie, Ming Liu.

*The Hong Kong University of Science and Technology*, 5/16/2023 - present.

2. **Transfer platform and joint data collection components.**

Xupeng Xie, Hexiang Wei, Jianhao Jiao, Hongji Liu, Ming Liu.

*The Hong Kong University of Science and Technology*, 6/27/2023 - present.

3. **A robust and accurate unmanned vehicle positioning system integrating gyroscope, encoder, GNSS, visual detection and high-definition map.**

Hongji Liu, Ming Liu, Lujia Wang.

*Shenzhen Unity-Drive Innovation Technology Co.,Ltd.*, 6/28/2022 - present.

4. **A robust positioning scheme of unmanned vehicle integrating gyroscope, encoder and GNSS.**

Hongji Liu, Ming Liu, Lujia Wang.

*Shenzhen Unity-Drive Innovation Technology Co.,Ltd.*, 7/12/2021 - present.

5. **An efficient method of calibrating the position and heading angle of unmanned vehicle by using high-definition map and visual detection.**

Hongji Liu, Ming Liu, Lujia Wang.

*Shenzhen Unity-Drive Innovation Technology Co.,Ltd.*, 7/12/2021 - present.

## SELECTED AWARDS AND HONORS

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- Baosteel outstanding student scholarship. *Nov 2018*
- The Seventeenth National College Student robot contest, Third prize in the south race area. *May 2018*
- American Mathematical Contest In Modeling, Honorable Mention. *Apr 2018*
- Contemporary Undergraduate Mathematical Contest In Modeling, Second prize in Guangdong *Jan 2018*
- Undergraduate Second-class Scholarship *Nov 2017*
- The fourteenth Challenge Cup, Guangdong college students' extracurricular academic and technological works competition, Second prize. *Jun 2017*
- The Sixteenth National College Student robot contest, Third prize in the south race area. *May 2017*
- American Mathematical Contest In Modeling, Honorable Mention. *Apr 2017*
- The twelfth Sun Yat-sen university Programming Competition, Third prize. *Apr 2017*
- The eighth Sun Yat-sen university Programming Novice Competition, Third prize. *Dec 2016*
- Undergraduate Second-class Scholarship. *Dec 2016*

## SELECTED RESEARCH PROJECTS

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### **Robot arm human portrait drawing.**

*Feb 2023 - Dec 2023*

Advisor: Prof. Ming Liu, *The Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China.*

- Quick contour feature extraction.
- Local feature enhancement.
- Image style conversion based on deep learning.

### **R & D and test of the first driverless logistics vehicle in Hong Kong that has obtained the operation license from the transport department.**

*Sept 2021 - Sept 2022*

Advisor: Prof. Ming Liu, *The Hong Kong University of Science and Technology, Hong Kong SAR, China.*

- Establishment, maintenance, editing and modification of high-precision maps within the campus.
- Long-term test under complex road conditions such as obstacle avoidance, fixed station parking, traffic interaction, and operation according to traffic rules.

### **R & D of port unmanned container truck visual localization system.**

*Dec 2019 - Aug 2021*

Advisor: Prof. Ming Liu, *Shenzhen Unity-Drive Innovation Technology Co.,Ltd. Shanghai, China, Guangzhou, China*

- Efficient and robust detection of ground markers.
- Dynamic extrinsic parameter calibration of camera.
- Development of sensor and system resource anomaly detection system.