

Huan Yin

[Google Scholar](#) ◇ [Profile](#) ◇ [Homepage](#) ◇ [GitHub](#) ◇ [Web of Science \(Publons\)](#)

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RESEARCH INTERESTS

Robotics, Autonomy, Navigation, Perception, State Estimation, SLAM, Planning, Deep Learning, LiDAR, Radar, Visual, Sensor Fusion, Place Recognition, Point Cloud Registration, Field Robots, Construction Automation, Service Robot, Autonomous Driving

WORK EXPERIENCE

Research Assistant Professor May 2022 - Present

Hong Kong University of Science and Technology, Hong Kong

Department of Electronic and Computer Engineering & [Cheng Kar-Shun Robotics Institute](#)

PI: [Prof. Fumin Zhang](#) (January 2024-Now)

PI: [Prof. Shaojie Shen](#) (May 2022-May 2024)

Research Fellow December 2021 - May 2022

National University of Singapore, Singapore

Department of Civil and Environmental Engineering & [Advanced Robotics Centre](#)

PI: [Dr. Justin Yeoh](#) Director: [Prof. Marcelo Ang](#)

EDUCATION

PhD in Control Engineering September 2016 - July 2021

Zhejiang University, China

College of Control Science and Engineering

Supervisor: [Prof. Rong Xiong](#) Co-Supervisor: [Prof. Yue Wang](#)

Visiting Scholar June 2018 - September 2018

University of Technology Sydney, Australia

[Centre for Autonomous Systems](#)

PI: [Prof. Shoudong Huang](#)

Bachelor in Electronics September 2012 - July 2016

Zhejiang University, China

College of Biomedical Engineering and Instrument Science

TEACHING

Full-time Instructor

ELEC 3210 - Introduction to Mobile Robotics Fall 2023

HKUST UG lectures ([Syllabus 2023](#)). Transferred to Prof. Shaojie Shen in Fall 2024 ([Syllabus 2024](#)).

EMIA 6500B - Pro. Dev. in Intelligent Construction and Robotics Spring 2023

HKUST PG seminars. Seminars on construction automation.

Substitute Teaching

ELEC 5660 - Introduction to Aerial Robotics Spring 2023, Spring 2024

HKUST PG lectures. Six hours on optical flow and stereo vision.

IIMP 6050 - Advanced Engineering Analysis Fall 2022

HKUST PG lectures. Six hours on introduction to mobile robots and SLAM.

AWARD

- *Best Poster Award*, granted by the 2024 ICRA Workshop: Radar in Robotics, May 2024
- *Wu Wenjun Artificial Intelligence Science and Technology Award, Nomination of Outstanding Doctoral Dissertation*, granted by the Chinese Association for Artificial Intelligence, March 2023
- *Second Prize of Invention and Entrepreneurship*, granted by the China Association of Inventions, November 2022
- *Outstanding Doctoral Dissertation Award*, granted by Zhejiang University, March 2022
- *Zhang Si-Ying Outstanding Youth Paper Award* of 2021 33rd Chinese Control and Decision Conference, Kunming, China, May 2021
- *Best Conference Paper Award* of IEEE International Conference on Real-time Computing and Robotics, Hokkaido, Japan, October 2020
- *Second Place of Kid-size Group* of World RoboCup League, Leipzig, Germany, July 2016
- *Bachelor's Thesis Award*, granted by Zhejiang University, June 2016

INVITED TALK

- *Zhejiang University, Ocean College, China*, July 2024
- *Hong Kong University of Science and Technology (Guangzhou), China*, May 2024
- *University of Edinburgh, United Kingdom*, April 2024
- *Hong Kong Polytechnic University, Hong Kong*, March 2024
- *University of Michigan-Dearborn, United States of America*, January 2024
- *Eastern Institute of Technology, Ningbo, China*, December 2023
- *Nanyang Technological University, Singapore*, September 2023
- *Hong Kong Sino Group, Hong Kong*, August 2023
- *University College London, United Kingdom*, June 2023
- *Hunan University, China*, April 2023
- *Hong Kong Center for Construction Robotics, Hong Kong*, December 2022
- *University of Macau, Macau*, November 2022

ACADEMIC SERVICE

Invited as

- *Associate Editor*, 2022, 2024, 2025 IEEE Conference on Robotics and Automation (ICRA)
- *Technical Program Committee*, 2025 International Conference on Automation, Control and Robotics Engineering ([CACRE](#))
- *Guest Editor*, Electronics, 2023 Special Issue
- *Youth Editorial Board Member*, 2023-2025, AI and Autonomous Systems
- *Meta-Reviewer*, 2022 CAAI International Conference on Artificial Intelligence (CICAI)

Invited as a Reviewer for

- (AdHoc) Ad Hoc Networks, 2021×1
- (SciRep) Scientific Reports, 2021×1

- (SatNav) Satellite Navigation, 2024×2
- (SensJ) IEEE Sensors Journal, 2025×1
- (CSR) IET Cyber-Systems and Robotics, 2025×1
- (RAS) Robotics and Autonomous Systems, 2023×1
- (RIA) Robotic Intelligence and Automation, 2025×1
- (AutoCon) Automation in Construction, 2023×1, 2024×1
- (T-RO) IEEE Transactions on Robotics, 2021×2, 2024×1
- (IJCV) International Journal of Computer Vision, 2022×1
- (T-IE) IEEE Transactions on Industrial Electronics, 2020×2
- (AIAS) Artificial Intelligence and Autonomous Systems, 2024×2
- (T-IV) IEEE Transactions on Intelligent Vehicles, 2021×1, 2024×2
- (IJRR) International Journal of Robotics Research, 2022×1, 2023×1
- (T-Mech) IEEE/ASME Transactions on Mechatronics, 2020×1, 2021×2
- (T-FR) IEEE Transactions on Field Robotics, 2022×2, 2023×1, 2024×1
- (ICRA) IEEE Conference on Robotics and Automation, 2022×5, 2024×2
- (PHOTO) ISPRS Journal of Photogrammetry and Remote Sensing, 2025×1
- (T-ASE) IEEE Transactions on Automation Science and Engineering, 2024×1
- (T-CDS) IEEE Transaction on Cognitive and Developmental Systems, 2025×1
- (RA-L) IEEE Robotics and Automation Letters, 2021×2, 2022×9, 2023×4, 2024×1
- (ITSC) IEEE International Conference on Intelligent Transportation Systems, 2022×1
- (T-ITS) IEEE Transactions on Intelligent Transportation Systems, 2019×1, 2020×4, 2024×1
- (IROS) IEEE/RSJ International Conference on Intelligent Robots and Systems, 2021×2, 2022×5, 2023×2, 2024×1, 2025×2

UNIVERSITY SERVICE

- MPhil Thesis exam committee: Xuanhong LIAO (ECE, HKUST, 2022), Xinyuan XU (IIMP, HKUST, 2023), Wenyu WANG (IIMP, HKUST, 2023), Manhao SITU (IIMP, HKUST, 2023), Guang CAI (IIMP, HKUST, 2023), Qiucan HUANG (IIMP, HKUST, 2024), Qiucan HUANG (IIMP, HKUST, 2024), Juhao SU (IIMP, HKUST, 2024), Guangzhen LIN (IIMP, HKUST, 2024), Haoqian LIU (IIMP, HKUST, 2024), Haozhen LI (IIMP, HKUST, 2024)

RESEARCH GRANT

- PI, 2024 HKUST-BDR Joint Research Institute Research Project, Key Technologies for Coverage Task Using Indoor Mobile Manipulators, *Funded*
- PI, 2024 UGC General Research Fund, Life-Cycle Metric-Semantic Robot Navigation Using BIM as Map, *Submitted*
- Co-I, 2024 UGC General Research Fund, Distributed Information Fusion for Cellular Mobile Sensor Networks, *Submitted*

PUBLICATION

(Notations: ¹ for co-advised HKUST students; ² for collaborators and PIs; ³ for former PhD supervisors;  for corresponding author)

Manuscripts

- M.1 Bingbing Zhang¹, **Huan Yin**, Shuo Liu, Fumin Zhang² and Wen Xu. VIMS: A Visual-Inertial-Magnetic-Sonar SLAM System in Underwater Environments. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2025. *Under Review*
- M.2 Fuzhang Han, Yanmei Jiao, Yufei Wei, Zhuqing Zhang, Yiyuan Pan, Wenjun Huang, Li Tang, **Huan Yin**, Xiaqing Ding, Rong Xiong^{3} and Yue Wang^{3}. Multi-cam Multi-map Visual Inertial Localization: System, Validation and Dataset. *IEEE Transactions on Field Robotics (T-FR)*, 2025 ([pdf](#)) ([video](#))

Journal

- J.1 Zehuan Yu¹, Zhijian Qiao¹, Wenyi Liu, **Huan Yin** and Shaojie Shen². SLIM: Scalable and Lightweight LiDAR Mapping in Urban Environments. *IEEE Transactions on Robotics (T-RO)*, 2025. ([pdf](#)) ([video](#)) ([code](#))
- J.2 Wugang Meng¹, Tianfu Wu, **Huan Yin** and Fumin Zhang². NuRF: Nudging the Particle Filter in Radiance Fields for Robot Visual Localization. *IEEE Transaction on Cognitive and Developmental Systems (T-CDS)*, 2025. ([pdf](#))
- J.3 Zhijian Qiao¹, Haoming Huang¹, Chuhao Liu, Zehuan Yu¹, Shaojie Shen², Fumin Zhang² and **Huan Yin**. Speak the Same Language: Global LiDAR Registration on BIM Using Pose Hough Transform. *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 2025. ([pdf](#)) ([video](#)) ([code](#))
- J.4 Yang Xu¹, Qiucan Huang¹, Shaojie Shen² and **Huan Yin**. Incorporating Point Uncertainty in Radar SLAM. *IEEE Robotics and Automation Letters (RA-L)*, 2025. ([pdf](#)) ([code](#))
- J.5 Zhijian Qiao¹, Zehuan Yu¹, Binqian Jiang, **Huan Yin** and Shaojie Shen². G3Reg: Pyramid Graph-based Global Registration using Gaussian Ellipsoid Model. *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 2024. ([pdf](#)) ([code](#)) ([benchmark](#))
- J.6 Weixin Ma², **Huan Yin**, Patricia Wong, Danwei Wang, Yuxiang Sun and Zhongqing Su. TripletLoc: One-Shot Global Localization using Semantic Triplet in Urban Environments. *IEEE Robotics and Automation Letters (RA-L)*, 2024.
- J.7 Weixin Ma², **Huan Yin**, Lei Yao, Yuxiang Sun and Zhongqing Su. Evaluation of Range Sensing-based Place Recognition for Long-term Urban Localization. *IEEE Transactions on Intelligent Vehicles (T-IV)*, 2024. ([pdf](#)) ([project](#))
- J.8 **Huan Yin**, Xuecheng Xu, Sha Lu, Xieyuanli Chen², Rong Xiong³, Shaojie Shen², Cyrill Stachniss² and Yue Wang^{3}. A Survey on Global LiDAR Localization: Challenges, Advances and Open Problems. *International Journal of Computer Vision (IJCV)*, 2024. ([pdf](#))
- J.9 **Huan Yin**, Zhiyi Lin² and Justin Yeoh^{2}. Semantic localization on BIM-generated maps using a 3D LiDAR sensor. *Automation in Construction (AutoCon)*, 2023. ([pdf](#)) ([video](#))
- J.10 **Huan Yin**, Yue Wang^{3}, Jun Wu and Rong Xiong³. Radar style transfer for metric robot localisation on lidar maps. *CAAI Transactions on Intelligence Technology*, 2022. ([pdf](#)) ([video](#))
- J.11 Shuo Sun², Zhiyang Liu², **Huan Yin** and Marcelo Ang^{2}. FISS Planner: A General Trajectory Planning Framework using Fast Iterative Search and Sampling Strategy for Autonomous Driving. *IEEE Robotics and Automation Letters (RA-L)*, 2022. ([pdf](#)) ([video](#))
- J.12 Zhiyi Lin², Chunyue Song^{2}, Jun Zhao and **Huan Yin**. Improved Approximate Dynamic Programming for Real-Time Economic Dispatch of Integrated Microgrids. *Energy*, Elsevier, 2022.

(pdf) (code)

- J.13 **Huan Yin**, Xuecheng Xu, Yue Wang^{3✉} and Rong Xiong³. Radar-to-Lidar: Heterogeneous Place Recognition via Joint Learning. *Frontiers in Robotics and AI*, 2021. (pdf) (code)
- Most Cited in Field Robotics Section**
- J.14 **Huan Yin**, Yue Wang^{3✉}, Runjian Chen and Rong Xiong^{3✉}. RaLL: End-to-end Radar Localization on Lidar Map Using Differentiable Measurement Model. *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2021. (pdf) (video) (code)
- J.15 Xuecheng Xu, **Huan Yin**, Zexi Chen, Yuehua Li, Yue Wang^{3✉} and Rong Xiong³. DiSCO: Differentiable Scan Context with Orientation. *IEEE Robotics and Automation Letters (RA-L)*, 2021. (pdf) (code)
- J.16 Runjian Chen, **Huan Yin**, Yanmei Jiao, Gamini Dissanayake, Yue Wang^{3✉}, and Rong Xiong³. Deep Samplable Observation Model for Global Localization and Kidnapping. *IEEE Robotics and Automation Letters (RA-L)*, 2021. (pdf) (code)
- J.17 **Huan Yin**, Yue Wang^{3✉}, Li Tang, Xiaqing Ding, Shoudong Huang² and Rong Xiong³. 3D LiDAR Map Compression for Efficient Localization on Resource Constrained Vehicles. *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2020. (pdf) (video) (code)
- J.18 **Huan Yin**, Yue Wang^{3✉}, Xiaqing Ding, Li Tang, Shoudong Huang² and Rong Xiong³. 3D LiDAR-Based Global Localization Using Siamese Neural Network. *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2019. (pdf) (video) (code)
- J.19 Xiaqing Ding, Yue Wang^{3✉}, Rong Xiong³, Dongxuan Li, Li Tang, **Huan Yin** and Liang Zhao. Persistent Stereo Visual Localization on Cross-Modal Invariant Map. *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2019. (pdf)
- J.20 Li Tang, Yue Wang^{3✉}, Xiaqing Ding, **Huan Yin**, Rong Xiong³ and Shoudong Huang². Topological local-metric framework for mobile robots navigation: a long term perspective. *Autonomous Robots (AURO)*, 2019. (pdf) (data)

Conference

- C.1 Haoming Huang¹, Zhijian Qiao¹, Zehuan Yu¹, Chuhao Liu, Shaojie Shen², Fumin Zhang², **Huan Yin**[✉]. SLABIM: A SLAM-BIM Coupled Dataset in HKUST Main Building. *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025. (video) (code)
- C.2 Wugang Meng¹, Tianfu Wu, **Huan Yin** and Fumin Zhang^{2✉}. BEINGS: Bayesian Embodied Image-goal Navigation with Gaussian Splatting. *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025. (pdf) (project)
- C.3 Jinzhi Cai¹, Scott Mayberry, **Huan Yin** and Fumin Zhang^{2✉}. A Data-Driven Velocity Estimator for Autonomous Underwater Vehicles Experiencing Unmeasurable Flow and Wave Disturbance. *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025.
- C.4 Qiucan Huang¹, Yuchen Liang, Zhijian Qiao¹, Shaojie Shen² and **Huan Yin**[✉]. Less is More: Physical-Enhanced Radar-Inertial Odometry. *IEEE International Conference on Robotics and Automation (ICRA)*, 2024. (pdf) (video) (code)
- C.5 Huibo Zhang, Shengkang Chen, **Huan Yin** and Fumin Zhang^{2✉}. An In-Context Learning Approach for LLM-enabled Multi-Robot Task Allocation. *2024 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2024. (pdf)
- C.6 Haozhe Wang[✉], Zhiyang Liu, Lei Zhou, **Huan Yin** and Marcelo Ang². PEGG-Net: Pixel-Wise Efficient Grasp Generation in Complex Scenes. *2024 IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and IEEE International Conference on Robotics, Automation and Mechatronics (RAM) (CIS-RAM 2024)* (pdf)

- C.7 Zhijian Qiao¹, Zehuan Yu¹, **Huan Yin**[✉] and Shaojie Shen². Online Monocular Lane Mapping Using Catmull-Rom Spline. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. ([pdf](#)) ([video](#)) ([code](#))
- C.8 Zhijian Qiao¹, Zehuan Yu¹, **Huan Yin**[✉] and Shaojie Shen². Pyramid Semantic Graph-based Global Point Cloud Registration with Low Overlap. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. ([pdf](#)) ([video](#)) ([code](#))
- C.9 Zehuan Yu¹, Zhijian Qiao¹, **Huan Yin**[✉] and Shaojie Shen². Multi-Session, Localization-oriented and Lightweight LiDAR Mapping Using Semantic Lines and Planes. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. ([pdf](#)) ([video](#))
- C.10 Sheng Hong, Chunran Zheng, **Huan Yin**[✉] and Shaojie Shen^{2✉}. Rollvox: Real-time and High-quality LiDAR Colorization with Rolling Shutter Camera. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. ([pdf](#))
- C.11 Yifan Chen, Shuo Sun, **Huan Yin** and Marcelo Ang^{2✉}. Exploring the Effect of 3D Object Removal using deep learning for LiDAR-based Mapping and Long-term Vehicular Localization. *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, 2022. ([pdf](#))
- C.12 Sha Lu, Xuecheng Xu, **Huan Yin**, Yue Wang^{3✉} and Rong Xiong³. One RING to Rule Them All: Radon Sinogram for Place Recognition, Orientation and Translation Estimation. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022. ([pdf](#))
- C.13 **Huan Yin**, Jia Min Liew, Lee Wai Leong, Marcelo Ang² and Justin Yeoh^{2✉}. Towards BIM-based robot localization: a real-world case study. *International Symposium on Automation and Robotics in Construction (ISARC)*, 2022. ([pdf](#))
- C.14 Hongxiang Yu, Dashun Guo, **Huan Yin**, Anzhe Chen, Kechun Xu, Zexi Chen, Minhang Wang, Qimeng Tan, Yue Wang^{3✉} and Rong Xiong³. Neural Motion Prediction for In-flight Uneven Object Catching. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021. ([pdf](#)) ([video](#))
- C.15 Zhiyi Lin², Chunyue Song^{2✉}, Jun Zhao, C. Yang and **Huan Yin**. Economic Dispatch of an Integrated Microgrid Based on the Dynamic Process of CCGT Plant. *Chinese Control and Decision Conference (CCDC)*, 2021. ([pdf](#))
- Zhang Si-Ying Outstanding Youth Paper**
- C.16 **Huan Yin**, Yue Wang³, Li Tang and Rong Xiong^{3✉}. Radar-on-Lidar: metric radar localization on prior lidar maps. *IEEE International Conference on Real-time Computing and Robotics (RCAR)*, 2020. ([pdf](#)) ([video](#))
- Best Conference Paper**
- C.17 **Huan Yin**, Li Tang, Xiaqing Ding, Yue Wang³ and Rong Xiong^{3✉}. A failure detection method for 3D LiDAR based localization. *Chinese Automation Congress (CAC)*, 2019. ([pdf](#))
- C.18 Xuanmeng Zhang, Yang Li, **Huan Yin** and Rong Xiong^{3✉}. 3D LiDAR Map Compression Using Deep Neural Network. *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2019. ([pdf](#))
- C.19 Xiaqing Ding, Yue Wang^{3✉}, Li Tang, **Huan Yin** and Rong Xiong^{3✉}. Communication constrained cloud-based long-term visual localization in real time. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019. ([pdf](#))
- C.20 Xiaqing Ding, Yue Wang^{3✉}, Dongxuan Li, Li Tang, **Huan Yin** and Rong Xiong^{3✉}. Laser map aided visual inertial localization in changing environment. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018. ([pdf](#))
- C.21 **Huan Yin**, Li Tang, Xiaqing Ding, Yue Wang^{3✉} and Rong Xiong³. LocNet: Global localization in 3D point clouds for mobile vehicles. *IEEE Intelligent Vehicles Symposium (IV)*, 2018. ([pdf](#)) ([code](#))

- C.22 **Huan Yin**, Xiaqing Ding, Li Tang, Yue Wang^{3✉} and Rong Xiong^{3✉}. Efficient 3D LIDAR based loop closing using deep neural network. *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2017. ([pdf](#))
- C.23 Xiaqing Ding, Yue Wang^{3✉}, **Huan Yin**, Li Tang and Rong Xiong^{3✉}. Multi-session Map Construction in Outdoor Dynamic Environment. *IEEE International Conference on Real-time Computing and Robotics (RCAR)*, 2018. ([pdf](#))
- C.24 Li Tang, Xiaqing Ding, **Huan Yin**, Yue Wang^{3✉} and Rong Xiong^{3✉}. From one to many: Unsupervised traversable area segmentation in off-road environment. *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2017. ([pdf](#)) ([video](#))

Non-refereed & Workshop Papers

- N.1 Yang Xu¹, Qiucan Huang¹, Shaojie Shen² and **Huan Yin**. Modeling Point Uncertainty in Radar SLAM. *ICRA Workshop on Radar in Robotics*, 2024.
Best Poster Award
- N.2 Haoming Huang¹, Zhijian Qiao¹, Zehuan Yu¹, Shaojie Shen² and **Huan Yin**. Lidar2BIM: Global Lidar Registration on BIM Leveraging Pose Hough Transform. *ICRA Workshop on Future of Construction*, 2024.
- N.3 **Huan Yin**, Yue Wang³ and Rong Xiong³. Improved Radar Localization on Lidar Maps Using Shared Embedding. *ICRA Workshop on Radar Perception for All-Weather Autonomy*, 2021. ([pdf](#))
Spotlight Talk
- N.4 **Huan Yin**, Dongdong Yu, Wenxing Mei, and Rong Xiong³. ZJUDancer Team Description Paper. *International RoboCup Federation. Humanoid robot development*, 2016. ([pdf](#)) ([video](#))

As of 04/2025