

JINGAO XU

Postdoctoral Associate, Computer Science Department, Carnegie Mellon University

Incoming Assistant Professor, Department of Electrical and Electronic Engineering, The University of Hong Kong

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RESEARCH INTERESTS

Mobile & Embedded Systems, AI Systems, Edge Computing, Embodied Navigation, AIoT

EMPLOYMENT

- **Carnegie Mellon University** Jun. 2024 - present
Postdoctoral Associate, Living Edge Lab, Computer Science Department
◦ Advisor: [Prof. Mahadev Satyanarayanan](#) Pittsburgh, USA
- **Tsinghua University** Jul. 2022 - Jun 2024
Postdoctoral Research Fellow, Institute of Trustworthy Networks and Systems, School of Software
◦ Advisor: [Prof. Yunhao Liu](#) & [Prof. Zheng Yang](#) Beijing, China
- **Microsoft Research Asia** Nov. 2016 - May 2017
Research Intern, Cloud & Mobile Research Group
◦ Mentor: [Prof. Yuanchao Shu](#) Beijing, China

EDUCATION

- **Tsinghua University** Sep. 2017 - Jun. 2022
Ph.D., Software Engineering
◦ Supervisor: [Prof. Yunhao Liu](#)
◦ Thesis: Edge-assisted Real-time Localization with Multi-modal Fusion Beijing, China
- **Tsinghua University** Aug. 2013 - Jul. 2017
Bachelor's Degree, Software Engineering Beijing, China

HONORS & AWARDS

- **Best Artifact Award**, ACM MobiCom'24 (2/494) 2024
- **ACM SIGCOMM China Doctoral Dissertation Award**, ACM 2022
- **Tsinghua Shui-Mu Scholarship**, Tsinghua University 2022
- **Outstanding Doctoral Dissertation Thesis**, 10 out of all CS-related graduates from Tsinghua University 2022
- **Outstanding Postgraduate Award**, Tsinghua & Beijing 2022
- **National Scholarship**, China 2021, 2016
- **Tsinghua Lin-Feng Counsellor Award**, Tsinghua University 2021
- **Best In-Session Presentation Award**, INFOCOM 2020 (1/6), INFOCOM 2019 (1/4) 2020
- **Outstanding Graduate Award**, Tsinghua & Beijing 2017

SELECTED PUBLICATIONS

CO-FIRST*, CORRESPONDING† AUTHOR, [STUDENTS I MENTORED](#)

Book

[B.1] [Jingao Xu](#), [Zheng Yang](#), [Yunhao Liu](#), [Hao Cao](#), [Edge Assisted Mobile Visual SLAM](#). Springer Book, ISBN: 978-981-97-3572-3, 2024

Conference

- [C.32] [Jingao Xu](#), [Longfei Shangguan](#), [Danyang Li](#), [Yunhao Liu](#), [Zheng Yang](#), "E-Cube: Event Enhanced Efficient Video Streaming for Drones", In Proceedings of the ACM EuroSys (**ACM EuroSys**), 2026
- [C.31] [Xuecheng Chen*](#), [Jingao Xu*](#), [Wenhua Ding](#), [Haoyang Wang](#), [Xinyu Luo](#), [Ruiyang Duan](#), [Jialong Chen](#), [Xueqian Wang](#), [Yunhao Liu](#), [Xinlei Chen](#), "Count Every Rotation and Every Rotation Counts: Exploring Drone Dynamics via Propeller Sensing", In Proceedings of the ACM SenSys (**ACM SenSys**), 2026
- [C.30] [Jingao Xu](#), [Mihir Bala](#), [Thomas Eiszler](#), [Xiangliang Chen](#), [Qifei Dong](#), [Aditya Chanana](#), [Padmanabhan Pillai](#), [Mahadev Satyanarayanan](#), "TerraSLAM: Towards GPS-Denied Localization", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2025
- [C.29] [Qifei Dong](#), [Jingao Xu](#), [Padmanabhan Pillai](#), [Mahadev Satyanarayanan](#), "Is Edge Computing Still Needed for Real-Time Computer Vision?", IEEE/ACM Symposium on Edge Computing (**ACM/IEEE SEC**), 2025

- [C.28] Haoyang Wang, **Jingao Xu**, Xinyu Luo, Xuecheng Chen, Ting Zhang, Ruiyang Duan, Yunhao Liu, Xinlei Chen, "Ultra-High-Frequency Harmony: mmWave Radar and Event Camera Orchestrate Accurate Drone Landing", ACM Conference on Embedded Networked Sensor Systems (**ACM SenSys**), 2025
- [C.27] Ciyu Ruan, Ruishan Guo, Zihang Gong, **Jingao Xu**, Wenhan Yang, Xinlei Chen, "PRE-Mamba: A 4D State Space Model for Ultra-High-Frequent Event Camera Deraining", IEEE/CVF International Conference on Computer Vision (**IEEE/CVF ICCV**), 2025
- [C.26] Kezhong Liu, Yiwen Zhou, Mozi Chen, Jianhua He, **Jingao Xu**, Zheng Yang, Chris Xiaoxuan Lu, Shengkai Zhang, "VISC: MmWave Radar Scene Flow Estimation Using Pervasive Visual-Inertial Supervision," IEEE/RISJ International Conference on Intelligent Robots and Systems (**IEEE/RISJ IROS**), 2025
- [C.25] Zhui Zhu, Xu Wang, **Jingao Xu**, Weichen Zhang, Yankun Yuan, Fan Dang, Lin Wang, Yunhao Liu, "DoMo: Rethinking Downscaling for Mobile Neural-enhanced Video Streaming", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2025
- [C.24] Xinqi Jin, Zhui Zhu, Xikai Sun, Fan Dang, Jiangchuan Liu, **Jingao Xu**, Kebin Liu, Xinlei Chen, Yunhao Liu, "Palantir: Towards Efficient Super Resolution for Ultra-high-definition Live Streaming", ACM Multimedia Systems Conference (**ACM MMSys**), 2025
- [C.23] Mihir Bala, Aditya Chanana, Xiangliang Chen, Qifei Dong, Thomas Eiszler, **Jingao Xu**, Padmanabhan Pillai, Mahadev Satyanarayanan, "The OODA Loop of Cloudlet-Based Autonomous Drones", IEEE/ACM Symposium on Edge Computing (**ACM/IEEE SEC**), 2024
- [C.22] Chenyu Zhao*, Ciyu Ruan*, **Jingao Xu[†]**, Haoyang Wang, Shengbo Wang, Jirong Zha, Jiaqi Li, Zheng Yang, Yunhao Liu, Xiao-Ping Zhang, and Xinlei Chen, "Foes or Friends: Embracing Ground Effect for Edge Detection on Lightweight Drones", ACM International Conference on Mobile Computing and Networking (**ACM MobiCom**), 2024
- [C.21] Guoxuan Chi, Zheng Yang, Chenshu Wu, **Jingao Xu**, Yuchong Gao, Yunhao Liu, and Tony Xiao Han, "RF-Diffusion: Radio Signal Generation via Time-Frequency Diffusion", ACM International Conference on Mobile Computing and Networking (**ACM MobiCom**), 2024, **Best Artifact Award**
- [C.20] Yuxuan Liu*, Haoyang Wang*, Fanhang Man, **Jingao Xu**, Fan Dang, Yunhao Liu, Xiao-Ping Zhang, and Xinlei Chen, "MobiAir: Unleashing Sensor Mobility for City-scale and Fine-grained Air-Quality Monitoring with AirBERT", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2024
- [C.19] Danyang Li, Yishujie Zhao, **Jingao Xu[†]**, Shengkai Zhang, Longfei Shangguan, and Zheng Yang, "edgeSLAM2: Rethinking Edge-Assisted Visual SLAM with On-Chip Intelligence", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2024
- [C.18] Hao Cao, **Jingao Xu[†]**, Danyang Li, Zheng Yang, and Yunhao Liu, "EventBoost: Event-based Acceleration Platform for Real-time Localization and Tracking", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2024
- [C.17] Haoyang Wang, **Jingao Xu**, Chenyu Zhao, Zihong Lu, Yuhan Cheng, Xuecheng Chen, Xiao-ping Zhang, Yunhao Liu, and Xinlei Chen, "TransformLoc: Transforming MAVs into Mobile Localization Infrastructures in Heterogeneous Swarms", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2024
- [C.16] Zeyu Wang, Xiaowu He, Xiangwen Zhuge, Shen Xu, Fan Dang, **Jingao Xu**, Zheng Yang, "Enabling Network Diagnostics in Time-Sensitive Networking: Protocol, Algorithm, and Hardware", IEEE/ACM International Symposium on Quality of Service (**IEEE/ACM IWQoS**), 2024
- [C.15] **Jingao Xu***, Danyang Li*, Longfei Shangguan, Yishujie Zhao, Hao Cao, Yunhao Liu, Zheng Yang, "Taming Event Cameras with Bio-Inspired Architecture and Algorithm: A Case for Drone Obstacle Avoidance", ACM International Conference on Mobile Computing and Networking (**ACM MobiCom**), 2023
- [C.14] Zeyu Wang, **Jingao Xu**, Xu Wang, Xiangwen Zhuge, Xiaowu He, Zheng Yang, "Industrial Knee-jerk: In-Network Simultaneous Planning and Control on a Switch", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2023
- [C.13] Yue Wu, **Jingao Xu**, Yadong Xie, Danyang Li, Hao Cao, Fan Li, Zheng Yang, "FlyTracker: Motion Tracking and Obstacle Detection for Drones Using Event Cameras", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2023
- [C.12] **Jingao Xu***, Hao Cao*, Zheng Yang, Longfei Shangguan, Jialin Zhang, Xiaowu He, Yunhao Liu, "SwarmMap: Scaling Up Real-time Collaborative Visual SLAM at the Edge", USENIX Symposium on Networked Systems Design and Implementation (**USENIX NSDI**), 2022
- [C.11] Danyang Li, **Jingao Xu**, Zheng Yang, Qian Zhang, Qiang Ma, Li Zhang, Pengpeng Chen, "Motion Inspires Notion: Self-supervised Visual-LiDAR Fusion for Environment Depth Estimation", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2022
- [C.10] Guoxuan Chi, Zheng Yang, **Jingao Xu**, Chenshu Wu, Jialin Zhang, Jianzhe Liang, Yunhao Liu, "Wi-Drone: Wi-Fi-based 6-DoF Tracking for Indoor Drone Flight Control", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2022

- [C.9] Jialin Zhang^{*}, Xiang Huang^{*}, **Jingao Xu**, Yue Wu, Qiang Ma, Xin Miao, Li Zhang, Pengpeng Chen, Zheng Yang, "Edge Assisted Real-time Instance Segmentation on Mobile Devices", IEEE International Conference on Distributed Computing Systems (**IEEE ICDCS**), 2022
- [C.8] **Jingao Xu**^{*}, Guoxuan Chi^{*}, Zheng Yang, Danyang Li, Qian Zhang, Qiang Ma, Xin Miao, "FollowUpAR: Enabling Follow-up Effects in Mobile AR Applications", ACM International Conference on Mobile Systems, Applications, and Services (**ACM MobiSys**), 2021
- [C.7] Danyang Li^{*}, **Jingao Xu**^{*}, Zheng Yang, Yumeng Lu, Qian Zhang, Xinglin Zhang, "Train Once, Locate Anytime for Anyone: Adversarial Learning Based Wireless Localization", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2021
- [C.6] Li Zhang, Yi Xu, Jinhui Bao, Qiuyu Wang, **Jingao Xu**, Danyang Li, Yaodong Yang, Min Zhang, "Multi-Region Indoor Localization Based on The WVP System", IEEE International Conference on Parallel and Distributed Systems (**IEEE ICPADS**), 2021
- [C.5] **Jingao Xu**^{*}, Hao Cao^{*}, Danyang Li, Kehong Huang, Chen Qian, Longfei Shangguan, Zheng Yang, "Edge Assisted Mobile Semantic Visual SLAM", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2020, **Best-in-session Presentation Award**
- [C.4] Erqun Dong, Jianzhe Liang, Zeyu Wang, **Jingao Xu**, Longfei Shangguan, Qiang Ma, Zheng Yang, "Improving the Applicability of Visual Peer-to-Peer Navigation with Crowdsourcing", IEEE International Conference on Parallel and Distributed Systems (**IEEE ICPADS**), 2020
- [C.3] Liang Dong, **Jingao Xu**, Guoxuan Chi, Danyang Li, Xinglin Zhang, Jianbo Li, Qiang Ma, Zheng Yang, "Enabling Surveillance Cameras to Navigate", International Conference on Computer Communications and Networks (**IEEE ICCCN**), 2020
- [C.2] Erqun Dong^{*}, **Jingao Xu**^{*}, Chenshu Wu, Yunhao Liu, Zheng Yang, "Pair-Navi: Peer-to-Peer Indoor Navigation with Mobile Visual SLAM", IEEE Conference on Computer Communications (**IEEE INFOCOM**), 2019, **Best-in-session Presentation Award**
- [C.1] **Jingao Xu**, Zheng Yang, Hengjie Chen, Yunhao Liu, Xiancun Zhou, Jianbo Li, Nicholas Lane, "Embracing Spatial Awareness For Reliable WiFi-based Indoor Location Systems", IEEE International Conference on Mobile Ad-hoc and Sensor Systems (**IEEE MASS**), 2018

Journal

- [J.15] Danyang Li^{*}, **Jingao Xu**^{*}, Zheng Yang, Yishujie Zhao, Hao Cao, Yunhao Liu, "Taming Event Cameras With Bio-Inspired Architecture and Algorithm: A Case for Drone Obstacle Avoidance", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2025
- [J.14] Nan Zhou, Yuxuan Liu, Haoyang Wang, Fanhang Man, **Jingao Xu**, Fan Dang, Chaopeng Hong, Yunhao Liu, Xiao-Ping Zhang, Yali Song, Qihua Wang, Xinlei Chen, "CatUA: Catalyzing Urban Air Quality Intelligence through Mobile Crowd-sensing", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2025
- [J.13] Danyang Li^{*}, **Jingao Xu**^{*}, Zheng Yang, Qian Zhang, Qiang Ma, Li Zhang, Pengpeng Chen, "LeoVR: Motion-inspired Visual-LiDAR Fusion for Environment Depth Estimation", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2024
- [J.12] Hao Cao^{*}, **Jingao Xu**^{*}, Zheng Yang, Longfei Shangguan, Jialin Zhang, Xiaowu He, Yunhao Liu, "Scaling Up Edge-assisted Real-time Collaborative Visual SLAM Applications", ACM/IEEE Transactions on Networking (**ACM/IEEE ToN**), 2024
- [J.11] Danyang Li, Yishujie Zhao, **Jingao Xu**[†], Shengkai Zhang, Longfei Shangguan, Zheng Yang, "Reshaping Edge-Assisted Visual SLAM by Embracing On-Chip Intelligence", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2024
- [J.10] Xuecheng Chen, Zijian Xiao, Yuhan Cheng, Chen-Chun Hsia, Haoyang Wang, **Jingao Xu**, Susu Xu, Fan Dang, Xiao-Ping Zhang, Xinlei Chen, "SOScheduler: Toward Proactive and Adaptive Wildfire Suppression via Multi-UAV Collaborative Scheduling", IEEE Internet of Things Journal (**IEEE IoTJ**), 2024
- [J.9] Xinjun Cai, **Jingao Xu**, Kuntian Deng, Hongbo Lan, Yue Wu, Xiangwen Zhuge, Zheng Yang, "TrinitySLAM: On-board Real-time Event-image Fusion SLAM System for Drones", ACM Transactions on Sensor Networks (**ACM TOSN**), 2024
- [J.8] Huilin Chen, Li Zhang, Danyang Li, **Jingao Xu**, Weiqi Yang, Zheng Yang, "REFLoc: A Resilient Evolutionary Fusion Framework for Robust Indoor Localization", IEEE Transactions on Instrumentation and Measurement (**IEEE TIM**), 2024
- [J.7] Hao Cao^{*}, **Jingao Xu**^{*}, Danyang Li, Longfei Shangguan, Yunhao Liu, Zheng Yang, "Edge Assisted Mobile Semantic Visual SLAM", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2022
- [J.6] **Jingao Xu**, Erqun Dong, Qiang Ma, Chenshu Wu, Zheng Yang, "Smartphone-based Indoor Visual Navigation with Leader-Follower Mode", ACM/IEEE Transactions on Sensor Network (**ACM TOSN**), 2021

- [J.5] Guoxuan Chi, **Jingao Xu**, Jialin Zhang, Qian Zhang, Qiang Ma, Zheng Yang, "Locate, Tell, and Guide: Enabling Public Cameras to Navigate the Public", IEEE Transactions on Mobile Computing (**IEEE TMC**), 2021
- [J.4] Danyang Li, **Jingao Xu**, Zheng Yang, Chenshu Wu, Jianbo Li, Nicholas D. Lane, "Wireless Localization with Spatial-Temporal Robust Fingerprints", ACM Transactions on Sensor Networks (**ACM TOSN**), 2021
- [J.3] Liang Dong, **Jingao Xu**, Guoxuan Chi, Danyang Li, Xinglin Zhang, Jianbo Li, Qiang Ma, Zheng Yang, "Enabling Surveillance Cameras to Navigate", ACM/IEEE Transactions on Sensor Network (**ACM TOSN**), 2021
- [J.2] **Jingao Xu**, Hengjie Chen, Kun Qian, Erqun Dong, Min Sun, Chenshu Wu, Li Zhang, Zheng Yang, "iVR: Integrated Vision and Radio Localization with Zero Human Effort", Proceedings of ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**ACM IMWUT/UbiComp**), 2019
- [J.1] Chenshu Wu, **Jingao Xu**, Zheng Yang, Nicholas D. Lane, Zuwei Yin, "Gain Without Pain: Accurate WiFi-based Localization with Fingerprint Spatial Gradient", Proceedings of ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**ACM IMWUT/UbiComp**), 2017

FUNDINGS

- [F.2] **PI**, "Research on Technology of Edge-assisted Multi-agent Collaborative Visual SLAM", Young Scientists Fund of the National Natural Science Foundation of China (**NSFC**), RMB 200K, 2023 - 2025
- [F.1] **PI**, "Research on Technology and Platform of Edge-assisted Real-time Visual SLAM", China Postdoctoral Science Fund - General Fund, RMB 80K, 2023 - 2024

PROFESSIONAL SERVICES

Organizing Committee Co-Chair

- ACM MobiSys Finance Chair 2025
- ACM HotMobile Publication Chair 2024
- ACM HotMobile Poster/Demo Chair 2024

Technical Program Committee Member

- IEEE ICPADS 2025, 2024, 2023
- EAI MobiQuitous 2025, 2024, 2023, 2022
- ACM MobiCom Artifact Evaluation 2024

Journal Reviewer

- ACM IMWUT/UbiComp, TOSN 2020 - present
- IEEE TMC, ToN, JSAC, Sensors Journal, IoT-J, RA-L, ACCESS 2021 - present

TEACHING & MENTORING

Guest Lecture

- **Edge Computing**, University of Pittsburgh Spring 2025
- **Visual SLAM for Robotic Perception**, University of Pittsburgh Fall 2024
- **The Evolution of Edge Computing**, Tsinghua University Spring 2024

Teaching Assist

- **The Frontiers of Computer Networking**, Graduate Course, Tsinghua University Spring 2019 - 2022
- **Software Engineering**, Undergraduate Course, Tsinghua University Fall 2017 - 2019

Mentorship

- **Danyang Li**, Ph.D. student -> Shui-Mu Scholar at Tsinghua 2019 - 2024
- **Guoxuan Chi**, Ph.D. student -> Postdoc at Tsinghua 2019 - 2024
- Hao Cao, Ph.D. student at Tsinghua -> AMD 2019 - 2024
- Zeyu Wang, Ph.D. student at Tsinghua -> HUAWEI 2020 - 2024
- **Haoyang Wang**, Ph.D. student at Tsinghua SIGS 2022 - present
- Chenyu Zhao, Master student at Tsinghua SIGS -> Ph.D. student at IC 2022 - present
- Xiangliang Chen, Master student -> Ph.D. student at CMU 2024 - present
- Qifei Dong, Ph.D. student at CMU 2024 - present
- **Counsellor of 85 Undergraduates of Class 2017** Aug. 2017 - Jul. 2021
School of Software, Tsinghua University
 - Our class won 10+ collective Awards including **Tsinghua Outstanding Class Collective & Beijing Outstanding Class Collective**
 - I was honored by **Tsinghua Lin-Feng Counsellor Award** and **12.9 Counsellor Award**, the **Toppest** and **Top** awards for counsellors in Tsinghua University!