

Haibao Yu

Ph.D. Candidate, The University of Hong Kong, Hong Kong

☎ (+852) 5640-1860 · (+86) 130-2110-1122 ✉ yuhaibao94@gmail.com



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SHORT BIOGRAPHY

I am a third-year Ph.D. candidate at [HKU-MMLAB](#), The University of Hong Kong, with an expected graduation date of June 2025. From May 2021, I led a research team focused on cooperative autonomous driving at the Joint Research Center of [Baidu Apollo](#) and [AIR-Tsinghua University](#). During this time, I contributed to the development and release of various autonomous driving datasets and benchmarks, including the pioneering real-world V2X dataset [DAIR-V2X](#). Prior to that, I worked as a computer vision researcher in autonomous driving at SenseTime Research starting in April 2019. My research portfolio spans 3D Object Detection, Tracking, Motion Forecasting, End-to-End Autonomous Driving, V2X, and Efficient AI. Currently, my research focuses on: (1) Advancing cooperative intelligence for multi-agent embodied intelligent systems. (2) Creating generative simulators to bridge real-world and simulated environments for autonomous driving and embodied AI. My unique strengths include:

- **Rich Experience:** Prior to pursuing my Ph.D., I worked in both industry (SenseTime) and academia (Tsinghua).
- **Diverse Research Background:** Mathematics (differential control systems), Autonomous Driving (entire stack including perception, motion prediction, end-to-end systems, efficient deployment on different chips, V2X), and Robotics.

EDUCATION

The University of Hong Kong, Hong Kong, China

Ph.D. Student - Computer Science

Research Topics: Autonomous Driving, V2X, Generative Simulation

September 2022 — Present

Advisory: Professor Ping Luo

Tsinghua University, Beijing, China

Visiting Student - Institute for AI Industry Research

Research Topics: Autonomous Driving, V2X

May 2023 — May 2024

Advisory: Professor Zaiqing Nie

Beihang University, Beijing, China

Master - Mathematics and Applied Mathematics

Research Topics: Control System, Differential Equation

September 2016 — June 2019

Advisory: Professor Zhikun She

Hong Kong Baptist University, Hong Kong, China

Visiting Student - High-performance Computing

July 2016 — August 2016

Advisory: Professor Xiaowen Chu

Sun Yat-Sen University, Guangzhou, China

Bachelor - Mathematics and Applied Mathematics

September 2012 — June 2016

PUBLICATIONS

* denotes equal contribution. ☒ denotes corresponding author.

- **Haibao Yu***, Wenxian Yang*, Ruiyang Hao*, Chuangye Wang*, Jiaru Zhong*, Ping Luo, Zaiqing Nie. “DriveE2E: Benchmarking Closed-Loop End-to-End Autonomous Driving Based-on Real-World Traffic Scenarios”. (Submission, 2024) [The first closed-loop benchmark for end-to-end autonomous driving based on real-world traffic scenarios.](#)
- **Haibao Yu**, Wenxian Yang, Jiaru Zhong, Zhenwei Yang, Siqi Fan, Ping Luo, Zaiqing Nie. “End-to-End Autonomous Driving through V2X Cooperation”. (Arxiv/Submission, 2024) [\[Paper\]](#) [\[Code\]](#) [The first end-to-end framework that seamlessly integrates all key driving modules across diverse views into a unified network.](#)
- **Haibao Yu**, Yingjuan Tang, Enze Xie, Jilei Mao, Ping Luo, Zaiqing Nie. “Flow-Based Feature Fusion for Vehicle-Infrastructure Cooperative 3D Object Detection”. *Advances in Neural Information Processing Systems 36 (NeurIPS2023)*
- **Haibao Yu**, Wenxian Yang, Hongzhi Ruan, et al. “V2X-Seq: A Large-Scale Sequential Dataset for Vehicle-Infrastructure Cooperative Perception and Forecasting”. *The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023 (CVPR2023)* [\[Paper\]](#) [\[Dataset\]](#) [\[Code\]](#)
- **Haibao Yu**, Yizhen Luo, Mao Shu, Yiyi Huo, et al. “DAIR-V2X: A Large-Scale Dataset for Vehicle-Infrastructure Cooperative 3D Object Detection”. *The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2022 (CVPR2022)* [\[Paper\]](#) [\[Dataset\]](#) [\[Code\]](#). [The first real-world dataset for cooperative autonomous driving.](#)

- **Haibao Yu***, Qi Han*, Jianbo Li, Jianping Shi, Guangliang Cheng, Bin Fan. “Search What You Want: Barrier Penalty NAS for Mixed Precision Quantization”. 16th European Conference on Computer Vision (**ECCV2020**)
- **Haibao Yu***, Tuopu Wen*, Guangliang Cheng, Jiankai Sun, Qi Han, Jianping Shi. “Low-bit Quantization Needs Good Distribution”. The IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW2020**)
- Hongzhi Ruan, **Haibao Yu**✉, Wenxian Yang, Siqi Fan, Zaiqing Nie✉. “Learning cooperative trajectory representations for motion forecasting”. 2024 Advances in Neural Information Processing Systems (**NeurIPs2024**)
- Siqi Fan, **Haibao Yu**, Wenxian Yang, Jirui Yuan, Zaiqing Nie. “Quest: Query Stream for Vehicle-Infrastructure Cooperative Perception”. 2024 IEEE International Conference on Robotics and Automatio (**ICRA2024**)
- Jiaru Zhong, **Haibao Yu**, Wenxian Yang, et al. “Leveraging Temporal Contexts to Enhance Vehicle-Infrastructure Cooperative Perception”. The 27th IEEE International Conference on Intelligent Transportation Systems (**ITSC2024**)
- Yao Mu, Junting Chen, Qinglong Zhang, Shoufa Chen, Qiaojun Yu, Chongjian Ge, Runjian Chen, Zhixuan Liang, Mengkang Hu, Chaofan Tao, Peize Sun, **Haibao Yu**, et al. “RoboCodeX: Multimodal Code Generation for Robotic Behavior Synthesis”. International Conference on Machine Learning (**ICML2024**)
- Ruiyang Hao*, Siqi Fan*, Yingru Dai, Zhenlin Zhang, Chenxi Li, Yuntian Wang, **Haibao Yu**, et al. “Rcooper: A Real-World Large-Scale Dataset for Roadside Cooperative Perception”. The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2024 (**CVPR2024**)
- Tao Yang, Zhezhi He, Tengchuan Kou, Qingzheng Li, Qi Han, **Haibao Yu**, et al. “A Winograd-based CNN Accelerator with A Fine-grained Regular Sparsity Pattern and Mixed Precision Quantization”. ACM Transactions on Reconfigurable Technology and Systems (TRETS, 2021)

WORK EXPERIENCES: FULL TIME

Institute of AI Industry Research (AIR), Tsinghua University

Research Engineer

Beijing, China

May 2021 — August 2022

- Worked at the Joint Research Center of AIR & Baidu Apollo, collaborating with Professor Zaiqing Nie.
- Led a research team comprising 5-10 engineers and interns, focused on autonomous driving and V2X.
- Released a series of real-world datasets and benchmarks: [DAIR-V2X](#), [V2X-Seq](#), [DAIR-RCooper](#)
- Built a series of algorithms for autonomous driving, encompassing 3D object detection, tracking, motion forecasting, end-to-end autonomous, simulation platform.

Autonomous Driving Group, SenseTime Group Ltd.

Computer Vision Researcher

Beijing, China

April 2019 — May 2021

- Led a R&D team focused on deep learning model compression and deployment for autonomous driving, and participated in several mass production projects.
- *Model Compression and Acceleration*: 4-bit & 8-bit quantization framework, sparse acceleration framework
- *Model Deployment for Different Chips*: FPGA, Ambarella, Nvidia, Qualcomm, et al.
- *Autonomous Driving Mass Production*: L0 ADAS for Hozon Auto, L2 ADAS for GAC Group

WORK EXPERIENCES: INTERNSHIPS

Autonomous Driving and Large Model Group, NIO

Research Intern

Beijing, China

July 2024 — October 2024

- Worked closely with Dr. Ningning Ma.

Autonomous Driving Group, SenseTime Group Ltd.

Computer Vision Research Intern

Beijing, China

March 2018 — March 2019

- Worked closely with Dr. Jianping Shi and Guangliang Cheng.

HONORS and AWARDS

- Research Innovation Award, SenseTime (20 applied, only 3 were awarded.) 2020
- National Scholarship, Beihang University 2018
- President's Scholarship, Beihang University 2017
- Innovation and Entrepreneurship Scholarship, Ministry of Industry and Information Technology 2017
- 4th place winner of **JD X Robot Challenge**, Jingdong (prize: 20,000 RMB) 2017
- National Encouragement Scholarship, Sun Yat-sen University 2014

ACADEMIC SERVICES

- Academic Activities:
 - Primary Organizer of [Workshop on Cooperative Intelligence for Autonomous Driving and Robotics](#), ECCV2024
 - Program Committee of [Wearable Intelligence for Healthcare Robotics Workshop](#), ICRA2024
 - Key organizer of [3D Object Detection Challenge through V2X Cooperation](#)
- Conference Reviewer:
 - CVPR(2023, 2024), ICCV(2023), ECCV(2022, 2024), ICRA(2024), IROS(2024)
- Journal Reviewer:
 - IEEE Internet of Things Journal
 - IEEE Transactions on Vehicular Technology

STAT-UP EXPERIENCE

MiraclePlus (Chinese YC Combinator), Beijing, China
Training campers

September 2024 — December 2024
Advisory: Dr. Qi Lu