Haibao Yu

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SHORT BIOGRAPHY

I am a third-year Ph.D. candidate at the University of Hong Kong with over six years of R&D experience in autonomous vehicles. Previously, I worked as a computer vision researcher at SenseTime and as a research engineer at Tsinghua University. I have published over five first-authored papers at top-tier conferences, including CVPR, NeurIPS, and ECCV. Currently, my work focuses on: 1) Advancing cooperative intelligence for multi-agent embodied intelligent systems. 2) Developing generative simulators to bridge the gap between real world and simulated environments for autonomous driving and embodied AI.

EDUCATION

The University of Hong Kong, Hong Kong, China — Sep. 2022 — Aug. 2025 (Expected)
Ph.D. Student in Computer Science
- Advisory: Professor **Ping Luo**, Laboratory: **Multimedia Laboratory (MMLAB) @ HKU**

Tsinghua University, Beijing, China — May 2023 — May 2024
Visiting Student at Institute for AI Industry Research
- Advisory: Professor **Zaiqing Nie**, Laboratory: **Big Data Intelligence Lab**

Beihang University, Beijing, China — Sep. 2016 — June 2019
M.Sc. in Mathematics and Applied Mathematics
- Advisory: Professor **Zhikun She**
- Thesis: Reachability Based Uniform Set Controllability Within Hamilton-Jacobi Framework

Hong Kong Baptist University, Hong Kong, China — July 2016 — Aug. 2016
Visiting Student in Computer Science
- Advisory: Professor **Xiaowen Chu**, Laboratory: **High Performance Cluster Computing Centre**

Sun Yat-Sen University, Guangzhou, China — Sep. 2012 — June 2016
B.Sc. in Mathematics and Applied Mathematics

PUBLICATIONS

[✉: corresponding author.]

End-to-End Autonomous Driving

- DriveE2E: Benchmarking Closed-Loop End-to-End Autonomous Driving Based-on Real-World Traffic Scenarios.
  Haibao Yu, Wenxian Yang, Ruiyang Hao, Chuanye Wang, Jiaru Zhong, Ping Luo, Zaiqing Nie. Pre-print 2024.
  (The first closed-loop benchmark for end-to-end autonomous driving based on real-world traffic scenarios.)

- End-to-End Autonomous Driving through V2X Cooperation.
  Haibao Yu, Wenxian Yang, Jiaru Zhong, Zhenwei Yang, Siqi Fan, Ping Luo, Zaiqing Nie. Pre-print 2024. (The first end-to-end framework that seamlessly integrates all key driving modules across diverse views into a unified network.)

Perception and Motion Forecasting

- Learning cooperative trajectory representations for motion forecasting.
  Hongzhi Ruan, **Haibao Yu**✉, Wenxian Yang, Siqi Fan, Zaiqing Nie✉. In **NeurIPs 2024**.

- Flow-Based Feature Fusion for Vehicle-Infrastructure Cooperative 3D Object Detection.
  Haibao Yu, Yingjuan Tang, Enze Xie, Jilei Mao, Ping Luo, Zaiqing Nie. In **NeurIPS 2023**.

- V2X-Seq: A Large-Scale Sequential Dataset for Vehicle-Infrastructure Cooperative Perception and Forecasting.
  Haibao Yu, Wenxian Yang, Hongzhi Ruan, et al. In **CVPR 2023**.

- **DAIR-V2X: A Large-Scale Dataset for Vehicle-Infrastructure Cooperative 3D Object Detection.**
  Haibao Yu, Yizhen Luo, Mao Shu, Yiyi Huo, et al. In **CVPR 2022** (**The first real-world dataset for cooperative autonomous driving. More than 30,000 Downloads.**)

- Quest: Query Stream for Vehicle-Infrastructure Cooperative Perception.
  Siqi Fan, **Haibao Yu**, Wenxian Yang, Jirui Yuan, Zaiqing Nie. In **ICRA 2024**.

- Leveraging Temporal Contexts to Enhance Vehicle-Infrastructure Cooperative Perception.
  Jiaru Zhong, **Haibao Yu**, Wenxian Yang, et al. In **ITSC 2024**.

- Rcooper: A Real-World Large-Scale Dataset for Roadside Cooperative Perception.
  Ruiyang Hao, Siqi Fan, Yingru Dai, Zhenlin Zhang, Chenxi Li, Yuntian Wang, **Haibao Yu**, et al. In **CVPR 2024**.

Hardware-Aware Efficient AI

- Search What You Want: Barrier Penalty NAS for Mixed Precision Quantization.
  Haibao Yu, Qi Han, Jianbo Li, Jianping Shi, Guangliang Cheng, Bin Fan. In **ECCV 2020**. (Won the Research Innovation Award, SenseTime (20 applied, only 3 were awarded.))

- Low-bit Quantization Needs Good Distribution.
  Haibao Yu, Tuopu Wen, Guangliang Cheng, Jiankai Sun, Qi Han, Jianping Shi. In **CVPR 2020 EDLCV Workshop**. (**Oral, widely used in SenseTime's product, such as autonomous driving.**)

- A Winograd-based CNN Accelerator with A Fine-grained Regular Sparsity Pattern and Mixed Precision Quantization.
  Tao Yang, Zhezhi He, Tengchuan Kou, Qingzheng Li, Qi Han, **Haibao Yu**, et al. In ACM Transactions on Reconfigurable Technology and Systems (TRETS, 2021).

Embodied AI

- RoboCodeX: Multimodal Code Generation for Robotic Behavior Synthesis.
  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. In **ICML 2024**.

- Medco: Medical education copilots based on a multi-agent framework.
  Hao Wei, Jianing Qiu, **Haibao Yu**, Wu Yuan. In **ECCV 2024 MAAS Workshop**.

WORK EXPERIENCES: FULL TIME

Institute of AI Industry Research (AIR), Tsinghua University — Beijing, China
Research Engineer — May 2021 — Aug. 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. — Beijing, China
Computer Vision Researcher — 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 — Beijing, China
Research Intern — July 2024 — October 2024

- Worked closely with Dr. Ningning Ma.

Autonomous Driving Group, Sensetime Group Ltd. — Beijing, China
Computer Vision Research Intern — 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 Committe of Wearable Intelligence for Healthcare Robotics Workshop, ICRA2024
  - Key Organizer of 3D Object Detection Challenge through V2X Cooperation. 2023
- 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

START-UP EXPERIENCE

MiraclePlus (Chinese YC Combinator), Beijing, China September 2024 — December 2024
Training campers
- Advisory: Dr. **Qi Lu**
- Product: Generative and Evaluation Platform for Autonomous Vehicles
- Investment Quota: $ 300,000