Haibao Yu

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SHORT BIOGRAPHY

I am a second-year Ph.D. student at HKU-MMLAB, The University of Hong Kong, advised by Professor Ping Luo. Additionally, I lead a research team focused on cooperative autonomous driving at the Joint Research Center of Baidu Apollo and AIR-Tsinghua University, collaborating closely with Professor Zaiqing Nie. Previously, I worked as a computer vision researcher for autonomous driving at SenseTime Research. My research encompasses 3D Perception, Motion Forecasting, End-to-End Autonomous Driving, V2X, and Efficient AI. Now, my research interests focus on developing Generative AI and building World Model Simulator for autonomous driving and embodied AI.

EDUCATION AND VISITING

The University of Hong Kong, Hong Kong, China — September 2022 — Present
Ph.D. Student - Computer Science — *Advisory: Professor Ping Luo*
Research Topics: Autonomous Driving, V2X, Generative AI

Beihang University, Beijing, China — September 2016 — June 2019
Master - Mathematics and Computational Mathematics — *Advisory: Professor Zhikun She*
Research Topics: Control System, Differential Equation

Hong Kong Baptist University, Hong Kong, China — July 2016 — August 2016
Visiting Student - High-performance Computing — *Advisory: Professor Xiaowen Chu*

Sun Yat-Sen University, Guangzhou, China — September 2012 — June 2016
Bachelor - Mathematics and Applied Mathematics

PUBLICATIONS

* denotes equal contribution.

- **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, Zhenwei yang, 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 3D detection 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**)

- 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**)

- Hongzhi Ruan, **Haibao Yu**, Wenxian Yang, Siqi Fan, Yingjuan Tang, Zaiqing Nie. "Learning Cooperative Trajectory Representations for Motion Forecasting". (Arxiv/Submission, 2024)

- 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**, Fangxin Liu, Yun Liang, Li Jiang. "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/PART TIME

Institute of AI Industry Research (AIR), Tsinghua University Beijing, China

Work Experience: I am working at the Joint Research Center of AIR & Baidu Apollo, collaborating with Professor Zaiqing Nie. I lead a research team comprising 5-10 engineers and interns, focused on autonomous driving and V2X.

- *Research Assistant/Intern* September 2022 — Present

- *Research Engineer* May 2021 — August 2022

Projects & Research Results

- *Releasing a series of real-world datasets:* DAIR-V2X, V2X-Seq, DAIR-RCooper

- *Hosing challenges and workshop:* 3D Object Detection Challenge, Coop-Intelligence Workshop

Department of Autonomous Driving, SenseTime Beijing, China

Work Experience: I worked closely with Dr. Jianping Shi and Dr. Guangliang Cheng. I led an R&D team focused on deep learning model compression and deployment for autonomous driving, and participated in several mass production projects.

- *Computer Vision Researcher* April 2019 — May 2021

- *Computer Vision Research Intern* March 2018 — March 2019

Projects & Research Results

- *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

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
- Conference Reviewer:
  - CVPR(2023, 2024), ICCV(2023), ECCV(2022, 2024)
- Journal Reviewer:
  - IEEE Internet of Things Journal
  - IEEE Transactions on Vehicular Technology