

Ruiyang Hao

Research Assistant, Institute for AI Industry Research, Tsinghua University

Google Scholar

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Education

Master, Electronic Engineering, Department of Automation, Tsinghua University 2020-2023

GPA: 4.00/4.00

Ranking: 1/159

Supervisor: Prof. Biqing Huang

B.S. (w Hons), Electronic Engineering, Shenyan Honors Collage, Beihang University 2016-2020

GPA: 3.83/4.00

Ranking: 1/51

Supervisor: Prof. Fei Tao

Skills: Proficient in Python, MATLAB, C++, and LaTeX

Publications

[1] K. Xu*, **Ruiyang Hao***, Hang Zhao, et al. (2024). Bridging the Open vs. Closed Loop Gap: New Open-Loop Evaluation Benchmarks for End-to-End Autonomous Driving Planning. Under Review. (* equal contribution, [Link](#))

[2] **Ruiyang Hao***, S. Fan*, Y. Dai, et al. (2024). RCooper: A Real-world Large-scale Dataset for Roadside Cooperative Perception. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2024)*, 22347-22357. (* equal contribution, [Link](#))

[3] R. Xu*, **Ruiyang Hao***, & B. Huang (2022). Efficient surface defect detection using self-supervised learning strategy and segmentation. *Advanced Engineering Informatics*, 52: 101566. (* equal contribution, [Link](#), IF: 8.0)

[4] **Ruiyang Hao**, B. Lu, Y. Cheng, et al. (2021). A Steel Surface Defect Inspection Approach towards Smart Industrial Monitoring. *Journal of Intelligent Manufacturing*, 32: 1833-1843. ([Link](#), IF: 5.9)

[5] **Ruiyang Hao**, Y. Cheng, Y. Zhang, et al. (2021). Manufacturing Service Supply-Demand Optimization with Dual Diversities for Industrial Internet Platforms. *Computers & Industrial Engineering*, 156: 107237. ([Link](#), IF: 6.7)

[6] J. Wang, X. Wang, **Ruiyang Hao**, et al. (2024). Incremental Template Neighborhood Matching for 3D Anomaly Detection. *Neurocomputing*, 581: 127483. ([Link](#), IF: 5.5)

[7] Y. Wang, X. Wang, **Ruiyang Hao**, et al. (2024). Metal surface defect detection method based on improved cascade R-CNN. *Journal of Computing & Information Science in Engineering*, 24(4): 041002. ([Link](#), IF: 3.1)

Research Experiences

2023.7-Now **Research Assistant @ Institute for AI Industry Research (AIR), Tsinghua University**

Advisor: Prof. Zaiqing Nie, Principal Investigator of AIR

Topic: *Vision Perception & Planning & Simulation for Autonomous Driving*

- Contributions:**
1. Lead to construct the first real-world, large-scale roadside cooperative perception dataset - RCooper, and construct the corresponding benchmarks leveraging SOTA cooperative methods.
 2. Propose new open-loop evaluation metrics for end-to-end autonomous driving, addressing the difference issues in xy-axis scale, speed scale, and scenario specifics.
 3. Improve diversity and complexity of road agents in autonomous driving simulator. (Ongoing)
 4. Construct more intelligent driving deciders leveraging VLMs and Multi-modality learning. (Ongoing)

2020.2-2023.7 **Graduate Research Assistant @ Department of Automation, Tsinghua University**

Advisor: Prof. Biqing Huang, Deputy Head of Institute of Industrial Intelligence and Systems

Topic: *Vision Perception for Industrial Defect Inspection*

- Contributions:**
1. Construct a glass defect recognition system which is applicable in practice, leveraging metric learning to extract robust features and an ensemble framework to address long-tail distribution.

“If a thing is worth doing, it is worth doing well!”

2. Propose an unsupervised segmentation method for industrial surface defect inspection, where self-supervised learning with homologous enhancement is designed without annotation.
3. Construct a shape-scale-aware defect inspection approach for steel surface defect detection, where deformable and atrous convolution structure and balanced feature pyramid are designed.

2022.6-2022.10 Research Intern @ Emerging Innovation Group, SenseTime Research

Advisor: Dr. Jiang Wu, Head of Remote Sensing Group

Topic: *Vision Perception for UAV Remote Sensing*

Contributions: 1. Design a semantic segmentation approach for narrow objects from the UAV view. Construct a multi-modality encoder and a multi-head, multi-task decoder to enhance the edge segmentation and direction perception, and design a post-processing method considering continuity.

2019.2-2020.3 Undergraduate Research Assistant @ Beihang University

Advisor: Prof. Fei Tao, Dean of International Research Institute for Multidisciplinary Science

Topic: *Evolutionary Computation in Industry*

Contributions: 1. Propose a dual diversities-aware industrial service supply-demand optimization model, and design a knowledge-guided NSGA-II multi-objective optimization algorithm to solve the mentioned optimization model.

Professional Services

Journal Reviewer of <i>Advanced Engineering Informatics, Journal of Industrial Information Integration, Journal of Real-Time Image Processing, The Visual Computer, etc.</i>	Since 2023
Member , Computer Vision Foundation (CVF)	Since 2024
Secretary , Graduate Thesis Defense Committee, Tsinghua University	2023
Program Committee Member , ECCV 2024 Workshop on Coop-Intelligence	2024

Selected Awards

National Scholarship , the Top Scholarship in China, top 1% of undergraduates	2018
First-class Excellence Scholarship , awarded by Tsinghua Univ., top 2% of graduate students	2022
First-class Excellence Scholarship , awarded by Tsinghua Univ., top 2% of graduate students	2021
Outstanding graduate and honored degree , awarded by Beihang Univ., top 5% of undergraduates	2021
Meritorious Prize of Interdisciplinary Contest in Modeling, awarded by the American Consortium for Mathematics and Its Applications, top 8% of contestants	2018& 2019

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