

HONGYANG LI 李弘扬

Research Scientist, OpenDriveLab, Shanghai AI Lab

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EDUCATION

The Chinese University of Hong Kong

August 2015 - July 2019

Ph.D. in Engineering, Thesis on *2D Object Detection*, Advisor: Prof. Xiaogang Wang

Dalian University of Technology

September 2009 - June 2014

B.S. in Electronic and Information Engineering, *summa cum laude*

RESEARCH INTERESTS

Deep Learning. Computer Vision. Machine Learning. Autonomous Driving. Foundation Model.

Perception Algorithm. Motion Prediction. Planning and Control. Policy Learning.

APPOINTMENT

PI / Research Scientist (青年科学家)

June 2022 - Present

Shanghai AI Lab (State Research Institute)

Shanghai, CHINA

Affiliated Post-doc Scholar

Feb 2022 - Present

Shanghai Jiao Tong University

Shanghai, CHINA

Senior Researcher

Sept 2019 - June 2022

SenseTime Research

Shanghai, CHINA

Research Intern

Jan 2019 - May 2019

Microsoft Research Asia

Beijing, CHINA

Research Intern

June 2018 - Dec 2018

Clarifai Inc.

San Francisco, USA

Research Associate

Dec 2014 - June 2015

The Chinese University of Hong Kong

Hong Kong, CHINA

AWARDS, FUNDING AND HONORS

- **Best Paper Award**, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), June 2023
For the paper, "Planning-oriented Autonomous Driving" as Project PI
- **The 100 Most Cited AI Papers** in 2022 (#40 / 100), European Conference on Computer Vision (ECCV), 2022.
Most influential ECCV Papers, Paper Digest, Jan 2023.
For the paper, "BEVFormer: Learning Bird's-Eye-View Representation from Multi-Camera Images via Spatiotemporal Transformers" as Co-first Author and Project PI

- Waymo Open Challenge 2022, 3D Object Detection Track, First Place
100+ teams participated from 13 countries
- 主持国家自然科学基金青年项目 (New Algorithm Design for End-to-end Autonomous Driving), 2023-2025
- 主持上海市启明星项目 (Recipient for Early Career Award, Shanghai Municipality), Dec 2022
- 高级工程师（副高级），上海市工程系列高级职称评审委员会, Oct 2022
- 杰出团队奖，智能驾驶 ADAS 团队，商汤科技, Dec 2020
- Recipient for Hong Kong Ph.D. Fellowship Scheme, 2015-2019
- Hong Kong Talent Development Scholarship, Class of 2015
- National Scholarship by Ministry of Education (本科生国家奖学金), 2011, 2012, 2013

PUBLICATION

Google scholar citation: approx. **2,000**, as of June 2023.

Peer-reviewed Conference Papers (in general the acceptance rate is below 25%)

22. Y. Gao, C. Sima, S. Shi, S. Di, S. Liu, **Hongyang Li**. Sparse Dense Fusion for 3D Object Detection. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct 2023.
21. Y. Hu, J. Yang, L. Chen, K. Li, C. Sima, X. Zhu, S. Chai, S. Du, T. Lin, W. Wang, L. Lu, X. Jia, Q. Liu, J. Dai, Y. Qiao, **Hongyang Li**. Planning-oriented Autonomous Driving. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023. [Best Paper Award](#)
20. C. Yang, Y. Chen, H. Tian, C. Tao, X. Zhu, Z. Zhang, G. Huang, **Hongyang Li**, Y. Qiao, L. Lu, J. Zhou, J. Dai. BEVFormer v2: Adapting Modern Image Backbones to Bird's-Eye-View Recognition via Perspective Supervision. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023. [Highlight Paper](#)
19. X. Jia, P. Wu, L. Chen, J. Xie, C. He, J. Yan, **Hongyang Li**. Think Twice before Driving: Towards Scalable Decoders for End-to-End Autonomous Driving. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023.
18. J. Zeng, L. Chen, H. Deng, L. Lu, J. Yan, Y. Qiao, **Hongyang Li**. Distilling Focal Knowledge from Imperfect Expert for 3D Object Detection. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023.
17. H. Xue, P. Gao, **Hongyang Li**, Y. Qiao, H. Sun, H. Li, J. Luo. Stare at What You See: Masked Image Modeling without Reconstruction. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023.
16. P. Wu, L. Chen, **Hongyang Li**, X. Jia, J. Yan, Y. Qiao. Policy Pre-training for End-to-end Autonomous Driving via Self-supervised Geometric Modeling. In *International Conference on Learning Representation (ICLR)*, May 2023.
15. X. Jia, L. Chen, P. Wu, J. Zeng, J. Yan, **Hongyang Li**, Y. Qiao. Towards Capturing the Temporal Dynamics for Trajectory Prediction: A Coarse-to-Fine Approach. In *Conference on Robot Learning (CoRL)*, Dec 2022.

14. P. Wu, X. Jia, L. Chen, J. Yan, **Hongyang Li**, Y. Qiao. Trajectory-guided Control Prediction for End-to-end Autonomous Driving: A Simple yet Strong Baseline. In *Thirty-sixth Conference on Neural Information Processing Systems (NeurIPS)*, Nov 2022. [[Carla Leaderboard, First Place](#)]
13. L. Chen, C. Sima, Y. Li, Z. Zheng, J. Xu, X. Geng, **Hongyang Li**, C. He, J. Shi, Y. Qiao, J. Yan. PersFormer: 3D Lane Detection via Perspective Transformer and the OpenLane Benchmark. In *European Conference on Computer Vision (ECCV)*, Sept 2022. [[Oral Presentation](#)][[Prototype transferred to XPENG Inc.](#)]
12. Z. Li, W. Wang, **Hongyang Li**, E. Xie, C. Sima, T. Lu, Q. Yu, J. Dai. BEVFormer: Learning Bird's-Eye-View Representation from Multi-Camera Images via Spatiotemporal Transformers. In *European Conference on Computer Vision (ECCV)*, Sept 2022. [[The 100 Most Cited AI Papers in 2022](#)] [[Waymo Open Challenge 2022, 3D Object Detection Track, First Place](#)] [[nuScenes Leaderboard, First Place](#)] [[Github star: 2k+](#)]
11. S. Hu, L. Chen, P. Wu, **Hongyang Li**, J. Yan, D. Tao. ST-P3: End-to-end Vision-based Autonomous Driving via Spatial-Temporal Feature Learning. In *European Conference on Computer Vision (ECCV)*, Sept 2022.
10. S. Zhang, L. Qiu, F. Zhu, J. Yan, H. Zhang, R. Zhao, **Hongyang Li**, X. Yang. Align representations with base: A new approach to self-supervised learning. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2022.
9. Y. Zhou, Y. He, H. Zhu, C. Wang, **Hongyang Li**, Q. Jiang. Monocular 3d object detection: An extrinsic parameter free approach. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2021.
8. S. Li, Z. Yan, **Hongyang Li**, K.-T. Cheng. Exploring intermediate representation for monocular vehicle pose estimation. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2021.
7. **Hongyang Li**, D. Eigen, S. Dodge, M. Zeiler, X. Wang. Finding Task-Relevant Features for Few-Shot Learning by Category Traversal. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019. [Oral Presentation](#)
6. **Hongyang Li**, B. Dai, S. Shi, W. Ouyang, X. Wang. Feature Intertwiner for Object Detection. In *International Conference on Learning Representation (ICLR)*, May 2019.
5. **Hongyang Li**, X. Guo, B. Dai, W. Ouyang, X. Wang. Neural Network Encapsulation. In *European Conference on Computer Vision (ECCV)*, Sept 2018.
4. Y. Liu, **Hongyang Li**, J. Yan, F. Wei, X. Wang, X. Tang. Recurrent Scale Approximation for Object Detection in CNN. In *IEEE International Conference on Computer Vision (ICCV)*, Oct 2017.
3. **Hongyang Li**, Y. Liu, X. Zhang, Z. An, J. Wang, Y. Chen, J. Tong. Do We Really Need More Training Data for Object Localization. In *IEEE International Conference on Image Processing (ICIP)*, Sept 2017.
2. **Hongyang Li**, W. Ouyang, X. Wang. Multi-bias Non-linear Activation in Deep Neural Networks. In *International Conference on Machine Learning (ICML)*, June 2016.
1. W. Ouyang, **Hongyang Li**, X. Zeng, X. Wang. Learning Deep Representation With Large-Scale Attributes. In *IEEE International Conference on Computer Vision (ICCV)*, Dec 2015.

Journal Articles

6. Y. Zhou, Y. He, H. Zhu, C. Wang, **Hongyang Li**, Q. Jiang. MonoEF: Extrinsic parameter free monocular 3D object detection. In *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, Dec 2021.
5. **Hongyang Li**, Y. Liu, W. Ouyang, X. Wang. Zoom Out-and-In Network with Map Attention Decision for Region Proposal and Object Detection. In *International Journal of Computer Vision (IJCV)*, June 2018.
4. **Hongyang Li**, J. Chen, H. Lu, Z. Chi. CNN for Saliency Detection with Low-level Feature Integration. In *Neurocomputing*, Feb 2017.
3. Z. Chi, **Hongyang Li**, H. Lu, M. Yang. Dual Deep Network for Visual Tracking. In *IEEE Transactions on Image Processing (TIP)*, Feb 2017.
2. W. Ouyang, X. Zeng, X. Wang, S. Qiu, P. Luo, Y. Tian, H. Li, S. Yang, Z. Wang, **Hongyang Li**, K. Wang, J. Yan, C.-C. Loy, X. Tang. DeepID-Net: Object detection with deformable part based convolutional neural networks. In *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, July 2016.
1. **Hongyang Li**, H. Hu, Z. Lin, X. Shen, B. Price. Inner and Inter Label Propagation: Salient Object Detection in the Wild. In *IEEE Transactions on Image Processing (TIP)*, Oct 2015.

Preprints

9. L. Chen, P. Wu, K. Chitta, B. Jaeger, A. Geiger, **Hongyang Li**. End-to-end Autonomous Driving: Challenges and Frontiers. In *arXiv:2306.16927*, June 2023.
8. H. Wang, Z. Liu, Y. Li, T. Li, L. Chen, C. Sima, Y. Wang, S. Jiang, F. Wen, H. Xu, P. Luo, J. Yan, W. Zhang, J. Yao, Y. Qiao, **Hongyang Li**. OpenLane-V2: A Topology Reasoning Benchmark for Scene Understanding in Autonomous Driving. In *arXiv:2304.10440*, Apr 2023.
7. T. Li, L. Chen, X. Geng, H. Wang, Y. Li, Z. Liu, S. Jiang, Y. Wang, H. Xu, C. Xu, F. Wen, P. Luo, J. Yan, W. Zhang, X. Wang, Y. Qiao, **Hongyang Li**. Topology Reasoning for Driving Scenes. In *arXiv:2304.05277*, Apr 2023. [[Prototype transferred to Huawei Inc.](#)]
6. L. Huang, H. Wang, J. Zeng, S. Zhang, L. Cao, R. Ji, J. Yan, **Hongyang Li**. Geometric-aware Pretraining for Vision-centric 3D Object Detection. In *arXiv:2304.03105*, Apr 2023.
5. W. Tong, J. Xie, T. Li, H. Deng, X. Geng, R. Zhou, D. Yang, B. Dai, L. Lu, **Hongyang Li**. 3D Data Augmentation for Driving Scenes on Camera. In *arXiv:2303.10340*, Mar 2023.
4. P. Gao, R. Zhang, R. Fang, Z. Lin, **Hongyang Li**, H. Li, Q. Yu. Mimic before Reconstruct: Enhancing Masked Autoencoders with Feature Mimicking. In *arXiv:2303.05475*, Mar 2023.
3. **Hongyang Li**, C. Sima, J. Dai, W. Wang, L. Lu, H. Wang, E. Xie, Z. Li, H. Deng, H. Tian, X. Zhu, L. Chen, Y. Gao, X. Geng, J. Zeng, Y. Li, J. Yang, X. Jia, B. Yu, Y. Qiao, D. Lin, S. Liu, J. Yan, J. Shi, P. Luo. Delving into the Devils of Bird's-eye-view Perception: A Review, Evaluation and Recipe. In *arXiv:2209.05324*, Sept 2022. [[Survey on Birds-eye-view Perception](#)]

2. L. Chen, T. Tang, Z. Cai, Y. Li, P. Wu, **Hongyang Li**, J. Shi, J. Yan, Y. Qiao. Level 2 autonomous driving on a single device: Diving into the devils of openpilot. In *arXiv:2206.08176*, June 2022. [[Prototype for Massive Production](#)]
1. X. Jia, P. Wu, L. Chen, **Hongyang Li**, Y. Liu, J. Yan. HDGT: Heterogeneous driving graph transformer for multi-agent trajectory prediction via scene encoding. In *arXiv:2205.09753*, Apr 2022.

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8. **Hongyang Li**, Y. Liu, W. Ouyang, X. Wang. Method and apparatus for detecting object, method and apparatus for training neural network, and electronic device. US Patent, *US20190156144A1*. May 2022
7. 王晓刚、欧阳万里、**李弘扬**、曾星宇：对标记有属性的对象进行聚类的方法和系统. CN Patent, *ZL 2015 8 0084335.9*. Apr 2022
6. **李弘扬**、郭晓阳、戴勃、欧阳万里、王晓刚：图像处理方法和装置、电子设备、存储介质、程序产品. CN Patent, *ZL 2018 1 0892869.X*. Nov 2020
5. **李弘扬**、刘宇、欧阳万里、王晓刚：物体检测方法、神经网络的训练方法、装置和电子设备. CN Patent, *ZL 2017 1 0100676.1*. Oct 2020
4. 基于鸟瞰图视角的三维目标检测综述与研究平台. Software Copyright, *2023SR0518514*. Oct 2022
3. 单目三维车道线检测知软件. Software Copyright, *2022SR0954172*. Apr 2022
2. 自动驾驶环视三维感知软件. Software Copyright, *2022SR1536002*. Apr 2022
1. Voting Member of the Autonomous Driving Working Group, *P3344 IEEE Standard for Scenario Description Language for Autonomous Driving*, Feb 2023

INVITED TALKS

- Turbo-boosting Neural Networks for Object Detection *Nvidia GTC, Jan Jose, CA, Mar 2019*
- Policy Pre-training for End-to-end Autonomous Driving *ECCV Workshop, Israel, Oct 2022*
- Scene Representation on Autonomous Driving *ICLR Workshop Panelist, Africa, May 2023*
- 自动驾驶三维道路结构认知 *VALSE Workshop, Tianjin, Aug 2022*
- 自动驾驶感知与高精地图之争 *GAIDC, Shanghai, Feb 2023*
- Bird-eye-view Perception in Autonomous Driving *SenseTime, Online, Aug 2022*
- 端到端自动驾驶算法体系思考 *Baidu Inc., Beijing, Feb 2023*
- Human-in-the-loop Algorithm Pipelining in Autonomous Driving *Fudan University, Nov 2021*
- New Advances in Autonomous Driving *Shanghai Jiao Tong University, Dec 2021*
- 通用感知与决策智能的协同进化 *Tsinghua University, July 2022*
- 以终端任务为驱动的端到端自动驾驶算法框架 *Tsinghua University, Apr 2023*

PROFESSIONAL SERVICE

Area Chair	IEEE CVPR 2023, 2024, NeurIPS 2023	
Workshop/Competition	<i>Organizer</i> , Scene Representation for Autonomous Driving	<i>ICLR 2023</i>
Program Committee	<i>Organizer-in-chief</i> , End-to-end Autonomous Driving	<i>CVPR 2023</i>
	<i>General and Award Chair</i> , Autonomous Driving Challenge [Most Influential Competition among 100+ CVPR 2023 workshops]	<i>CVPR 2023</i>
	<i>Paper Session Chair</i> , Visual Continual Learning	<i>ICCV 2023</i>
	<i>Organizer</i> , Bird's-eye-view Perception	<i>PRCV 2022</i>
Membership	<i>Senior Member</i> , Institute of Electrical and Electronics Engineers (IEEE)	<i>USA</i>
	<i>Member</i> , Association for Computing Machinery (ACM)	<i>USA</i>
	<i>Member</i> , Association for the Advancement of Artificial Intelligence (AAAI)	<i>USA</i>
	<i>Member</i> , China Computer Foundation (CCF)	<i>China</i>

TEACHING ACTIVITY

-
- *Co-lecturer*, Advanced Computer Vision, Tsinghua University *Spring 2023*
 - *Co-lecturer*, Advanced Computer Vision, Tsinghua University
[\[Media Coverage by Tsinghua EE Dept.\]](#)[\[Course website\]](#) *Spring 2022*
 - *Co-lecturer*, Advanced Computer Vision, Tsinghua University *Spring 2021*

ADVISING ACTIVITY**Ph.D. Advisees**

-
- Li Chen (Feb 2023 - present), The University of Hong Kong *co-supervised with Ping Luo*
[\[First author of CVPR Best Paper and ECCV Oral Paper\]](#) [\[WAIC 2023 云帆奖明日之星\]](#)
 - Chonghao Sima (June 2023 - present), The University of Hong Kong *co-supervised with Ping Luo*
 - Tianyu Li (Sep 2023 - present), Fudan University *co-supervised with Xiaogang Wang*