Yikang LI

AN INCURABLE OPTIMIST · Embodied AGI Believer · LEGO enthusiast

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"Make the change that you want to see in the world."

Education

Department of Electronic Engineering, The Chinese University of Hong Kong *Hong Kong SAR*

Ph.D. in Computer Vision and Machine Learning *Aug. 2016 - May. 2020*

- Supervised by Prof. Xiaogang WANG and Prof. Xiaoou TANG.
- Awardee of Hong Kong PhD Fellowship Scheme(HKPFS) and Microsoft Research Asia (MSRA) PhD Fellowship.

Department of Electronic Engineering, Tsinghua University *Beijing, China*

B.S. in Electronic Engineering & Economics *(2nd major)* *Aug. 2011 - July. 2016*

- GPA: 92/100. Ranking: 1/18 or 8/181. National Scholarship awardee and Class monitor.
- The 2nd Major equipped me with economic thinking and the fundamental knowledge about finance, business and economics.

Telecommunications, University of New South Wales *Sydney, Australia*

Exchange Student *July. 2013 - Nov. 2013*

- National exchange scholarship awardee. Funded by State Scholarship Council(CSC).
- Supervised by Prof. Jayantha Katupitiya on the 4WD4WS Quadbike Project.

Working Experience

VC Team, IDG Capital *Shainghai, China*

AI Investor | AI Industry Observer (as Career Gap Year) *Aug. 2022 till now*

- Cover the area of Large Language Model (LLM), Generative AI (GAI) and Embodied AI / Robotics.
- PIC of Zhipu AI and project member of Xiaoice, MiniMax and Light Year AI etc.
- PIC of AI research, authoring 6 research reports covering Foundation Model, open-sourcing, AI infra, applications, etc.

Autonomous Driving Group, Shanghai AI Laboratory *Shainghai, China*

Research Scientist | PI *Apr. 2021 - Jul. 2023*

- Principle Investigator of Autonomous Driving Research, leading 20+ full-time researchers.
- We focus on designing a data-driven simulation framework that can reflect the real-world performance of autonomous driving.
- Our auto-labeling system ranks 1st on Waymo 3D Detection Benchmark, surpassing the 2nd by a large margin.
- Research interest covers 3D Scene Reconstruction, 3D Scene Perception, Behavior & Scene Simulation, etc.
- From Aug. 2022, I started serving as the consultant and research committee member to support the team.

Autonomous Driving Group, Sensetime Group Ltd. *Hong Kong*

Deputy Director of R&D | L4 Product Lead *Feb. 2019 - Jul. 2022*

- Reporting to Jianping Shi, executive director of Autonomous Driving Group.
- Leading the Level-4 Autonomous Driving Product Team (25+ members).
- In charge of the projects like C-V2X autonomous minibus development, L4 license testing, the reference system development, etc.
- Leading the testing department of the Autonomous Driving and ADAS Projects.
- Designing the multi-sensor platform including calibrations, time synchronization, sensor fusion algorithm research, etc.

Natural Language Computing, Microsoft Research Asia (MSRA) *Beijing, China*

Research Intern *June. 2017 - Oct. 2017 & Oct. 2018 - Jan. 2019*

- Supervised by Nan Duan and Ming Zhou, in the area of Language and Vision.
- We explore the possibility to apply both NLP and CV techniques to do some interesting and promising works.
- One CVPR paper on Visual Question Answering and one NeurIPS paper on Text-to-Image Synthesis are published.

Nimble VR, Facebook Reality Labs (FRL) *Sausalito CA, USA*

Research Intern *May. 2018 - Sep. 2018*

- Mentored by Chris Twigg, Yuting YE and Lingling TAO.
- We focus on generating hand images with various pose-appearance combinations by disentangling the pose from miscellaneous factors and re-combining them. We can use N images to synthesize N(N-1) images to enhance the model training.

Visual Computing Group, Microsoft Research Asia (MSRA) *Beijing, China*

RESEARCH INTERN *Jul. 2014 - May. 2015*

- Supervised by Lead Researcher, Lu Yuan, in the area of Computational Photography on the following two projects.
- *HDR automatic detection:* to help mobile phones detect whether the current scene is the HDR-scene using light-weight classifier.
- *Intelligent Burst HDR Capture:* to recover HDR images using burst-captured images with predicted exposure settings.

Selected Projects

Multi-task Perception with Multi-modal Input
Shanghai AI Lab

CORE TEAM: BOTIAN SHI, TAO MA, YUENAN HOU, XUEMENG YANG, HONGBIN ZHOU, XIN LI, ETC. *Mar. 2021 - Aug. 2023*

- Multi-model fusion, temporal fusion, and multi-dataset fusion are investigated to enhance the 3D perception performance.
- Our DetZero achieves on-par-with-human performance and ranks 1st in Waymo 3D Detection Leaderboard (Since 2023.3).
- *10 top-tier conference papers* are published in the related areas, including CVPR, ICCV, AAAI, etc.

Smart Sensor Sets for Autonomous Driving
Shanghai AI Lab & Sensetime Group

CORE TEAM: GUOHANG YAN, XINYU CAI, TAO MA, ZHIZHENG LIU, ETC. *May 2020 - Jul. 2023*

- Automatically designing the optimal sensor set and precisely finishing the sensors calibration is our target.
- *More than 5 top-tier papers* are published to investigate how to set up a robust sensor set.
- We open-source the most complete AD calibration tool for AD, OpenCalib, gaining more than 1.5k stars.

Smart Agent with human-like behaviors for Simulation
Shanghai AI Lab

CORE TEAM: PINLONG CAI, SONG MAO, LICHENG WEN, DAOCHENG FU, XING GAO, ETC. *Jun. 2021 - Jun. 2023*

- Data-driven autonomous driving (AD) requires diverse and numerous dynamic scenarios for verification and validation.
- We investigate how to model multi-agent behavior via learning-based and rule-based methods.
- *5 top-tier papers* are published and a light-weighted traffic simulator, *LimSim*, is open-sourced for the community.

3D Scene Reconstruction and Generation
Shanghai AI Lab

CORE TEAM: JIANFEI GUO, XINYANG LI, QIUSHENG HUANG, NIANCHEN DENG, ETC. *May 2021 - Jun. 2023*

- Data-driven autonomous driving (AD) requires numerous raw sensor data with annotations. Synthesizing data provides accurate labeling but lacks realism. Neural Rendering (like NeRF) provides a promising way to solve this problem.
- We set up a pure research team aiming at solving the core challenges in the application of the NeRF-related approaches.
- We present a novel multi-view implicit surface reconstruction technique, termed StreetSurf, supporting camera and LiDAR input.

Senseauto Robobus - L4 Autonomous Driving Product
Sensetime Group

CORE TEAM: SENSEAUTO L4 PRODUCT TEAM *Jul. 2020 - Dec. 2022*

- We design Sensetime's first L4 product from scratch, from the initial selection of the vehicle body and sensors to fine-tuning system performance, all the way through to final customer delivery.
- Our robobus passed the Shanghai & Beijing ICV Road Testing and obtained the open road testing certificates.
- More than 5 buses were delivered to final customers and put into operations, generating more than 10M Yuan revenue.

Senseauto Verification and Validation Platform
Sensetime Group

CORE TEAM: SENSEAUTO L4 V&V TEAM *Jan. 2019 - Dec. 2022*

- We built the full verification and validation system for Sensetime's Autonomous Driving Project from scratch.
- Our V&V system contains full SIL/HIL/VIL testing procedure and a 50-vehicle testing fleet, operating more than 500k km.
- Our designed Automated Data Operating system can efficiently collect, manage and utilize field-testing data.

Honors & Awards

2021	**Outstanding Group for L4 RoboBus Product Team**, Sensetime Group	*Shanghai, China*
2020	**Outstanding Employee**, Sensetime Group	*Shanghai, China*
2019	**Overseas High-Caliber Personnel**, C-class	*Shenzhen, China*
2019	**CVPR 2019 Doctoral Consortium**, 40 Ph.D. Candidates world-wide	*Long Beach, USA*
2018	**Microsoft Research PhD Fellowship**, 11 awardees in Asia-Pacific Area.	*Beijing, China*
2018	**Outstanding Student Award (Team Award)**, The Chinese University of Hong Kong	*Hong Kong, China*
2016	**Hong Kong PhD Fellowship**, about 230 awardees per year in Hong Kong	*Hong Kong, China*
2016	**Outstanding Final-Year Project**, Top 10% student in EE Department	*Beijing, China*
2013/14/15	**ST Engineering Scholarship**, Top 5% student in EE Department	*Singapore*
2014	**National Scholarship**, Top 1% student in EE Department	*Beijing, China*
2013	**Exchange Student Scholarship**, National Excellent Undergraduate Exchange Scheme	*Sydney, Australia*
2012	**Special Award**, Tsinghua Universty 7th Automobile Design Competition	*Beijing, China*

Selected Activities

2017 - now	**Conference PC Member**, ICML, ICLR, CVPR, AAAI, NeurIPS, ICML, ICCV, ECCV, IJCAI, etc.	*World-wide*
2018 - now	**Journal Reviewer**, TPAMI, IJCV, TIP, R-AL, etc.	*World-wide*
2021 - now	**Committee Member**, Shanghai Intelligent & Connected Vehicle Standardization Committee	*Shanghai, China*
2021	**Editorial Board Member**, White Paper for Technique Innovations in Autonomous Industry (2021)	*Shanghai, China*
2021	**Group Standard Editor**,, General Technique Requirements for Autonomous Minibus	*Shaanxi, China*
2020	**Review Panelist**, Shanghai's Intelligent & Connected Vehicle Specialist Committee	*Shanghai, China*
2019	**Review Panelist**, Wuhan's Intelligent & Connected Vehicle Specialist Committee	*Wuhan, China*
2016-2018	**Associate Vice President**, CUHK Chinese Students and Scholars Association (CSSA)	*Hong Kong SAR*
2016-2018	**Vice President**, CUHK Postgraduate Hall Residents' Association (PGHRA)	*Hong Kong SAR*
2013-2014	**Activity Department Minister**, Business Association of Tsinghua Entrepreneurial Students	*Beijing, China*

Paper List

Multi-task Perception with Multi-modal Input

- **DetZero: Rethinking Offboard 3D Object Detection with Long-term Sequential Point Clouds**, Tao Ma, Xuemeng Yang, Hongbin Zhou, Xin Li, Botian Shi, Junjie Liu, Yuchen Yang, Zhizheng Liu, Liang He, Yu Qiao, **Yikang LI**∗, Hongsheng Li∗, *ICCV 2023*
- **LoGoNet: Towards Accurate 3D Object Detection with Local-to-Global Cross-Modal Fusion**, Xin Li, Tao Ma, Yuenan Hou, Botian Shi, Yuchen Yang, Youquan Liu, Xingjiao Wu, Qin Chen, **Yikang LI**∗, Yu Qiao, Liang He∗, *ICCV 2023*
- **CLIP2Scene: Towards Label-efficient 3D Scene Understanding by CLIP**, Runnan Chen, Youquan Liu, Lingdong Kong, Xinge Zhu, Yuexin Ma, **Yikang LI**, Yuenan Hou, Yu Qiao, Wenping Wang, *CVPR 2023*
- **SCPNet: Semantic Scene Completion on Point Cloud**, Zhaoyang Xia, Youquan Liu, Xin Li, Xinge Zhu, Yuexin Ma, **Yikang LI**, Yuenan Hou, Yu Qiao, *CVPR 2023*
- **LWSIS: LiDAR-guided Weakly Supervised Instance Segmentation for Autonomous Driving**, Xiang Li, Junbo Yin, Botian Shi, Yikang Li, Ruigang Yang, Jianbin Shen, *AAAI 2023*
- **Homogeneous multi-modal feature fusion and interaction for 3D object detection**, Xin Li, Botian Shi, Yuenan Hou, Xingjiao Wu, Tianlong Ma, **Yikang LI**∗, Liang He∗, *ECCV 2022*
- **Comprehensive review of deep learning-based 3d point cloud completion processing and analysis**, Ben Fei, Weidong Yang, Wen-Ming Chen, Zhijun Li, **Yikang LI**, Tao Ma, Xing Hu, Lipeng Ma, *T-ITS*
- **Multi-modal sensor fusion for auto driving perception: A survey**, Keli Huang, Botian Shi, Xiang Li, Xin Li, Siyuan Huang, **Yikang LI**∗, *Arxiv Preprint*
- **Point-to-Voxel Knowledge Distillation for LiDAR Semantic Segmentation**, Yuenan Hou, Xinge Zhu, Yuexin Ma, Chen Change Loy, **Yikang LI**∗, *CVPR 2022*

Smart Agent with Human-like Behaviors for Simulation

- **Dynamic Scenario Representation Learning for Motion Forecasting With Heterogeneous Graph Convolutional Recurrent Networks**, Xing Gao, Xiaogang Jia, **Yikang LI**, Hongkai Xiong, *RA-L*
- **Bringing Diversity to Autonomous Vehicles: An Interpretable Multi-vehicle Decision-making and Planning Framework**, Licheng Wen, Pinlong Cai, Daocheng Fu, Song Mao, **Yikang LI**∗, *AAMAS 2023*
- **Hybrid cooperative intersection management for connected automated vehicles and pedestrians**, Pinlong Cai, Jia He, **Yikang LI**∗, *J-ICV*
- **LimSim: A Long-term Interactive Multi-scenario Traffic Simulator**, Licheng Wen, Daocheng Fu, Song Mao, Pinlong Cai, Min Dou, **Yikang LI**∗, *ITS-C 2023*
- **General Driving Behavior Model based on the Desired Safety Margin for Vehicle Flow Simulation**, Pinlong Cai, Junjie Zhang, Xuan Zhao, **Yikang LI**∗, *ITS-C 2022*

Smart Sensor Sets for Autonomous Driving

- **Optimizing the Placement of Roadside LiDARs for Autonomous Driving**, Wentao Jiang, Hao Xiang, Xinyu Cai, Runsheng Xu, Jiaqi Ma, **Yikang LI**∗, Gim Hee Lee, Si Liu∗, *ECCV 2023*
- **Calib-Anything: Zero-training LiDAR-Camera Extrinsic Calibration Method Using Segment Anything**, Zhaotong Luo, Guohang Yan, **Yikang LI**∗, *Arxiv Preprint*
- **Automatic Surround Camera Calibration Method in Road Scene for Self-driving Car**, Jixiang Li, Jiahao Pi, Guohang Yan, **Yikang LI**∗, *Opensource Project*

- **Joint camera intrinsic and lidar-camera extrinsic calibration**, Guohang Yan, Feiyu He, Chunlei Shi, Pengjin Wei, Xinyu Cai, **Yikang LI**∗, *ICRA 2023*
- **Analyzing infrastructure lidar placement with realistic lidar library**, Xinyu Cai, Wentao Jiang, Runsheng Xu, Wenquan Zhao, Jiaqi Ma, Si Liu, **Yikang LI**∗, *ICRA 2023*
- **SensorX2car: Sensors-to-car calibration for autonomous driving in road scenarios**, Guohang Yan, Zhaotong Luo, Zhuochun Liu, **Yikang LI**∗, *Arxiv Preprint*
- **CROON: Automatic Multi-LiDAR Calibration and Refinement Method in Road Scene**, Pengjin Wei, Guohang Yan, **Yikang LI**, Kun Fang, Wei Liu, Xinyu Cai, Jie Yang, *IROS 2022*
- **CRLF: Automatic Calibration and Refinement based on Line Feature for LiDAR and Camera in Road Scenes**, Tao Ma, Zhizheng Liu, Guohang Yan, **Yikang LI**∗, *Arxiv Preprint*
- **OpenCalib: A Multi-sensor Calibration Toolbox for Autonomous Driving**, Guohang Yan, Liu Zhuochun, Chengjie Wang, Chunlei Shi, Pengjin Wei, Xinyu Cai, Tao Ma, Zhizheng Liu, Zebin Zhong, Yuqian Liu, Ming Zhao, Zheng Ma, **Yikang LI**∗, *Opensource Project*

3D Scene Reconstruction and Generation

- **Human-like Decision-making at Unsignalized Intersection using Social Value Orientation**, Yan Tong, Licheng Wen, Pinlong Cai, Daocheng Fu, Song Mao, Yikang Li, *Arxiv Preprint*
- **L-Tracing: Fast Light Visibility Estimation on Neural Surfaces by Sphere Tracing**, Ziyu Chen, Chenjing Ding, Jianfei Guo, Dongliang Wang, **Yikang LI**, Xuan Xiao, Wei Wu, Li Song, *ECCV 2022*

Perception Generalization across different Scenarios for Autonomous Driving

- **AD-PT: Autonomous Driving Pre-Training with Large-scale Point Cloud Dataset**, Jiakang Yuan, Bo Zhang, Xiangchao Yan, Tao Chen, Botian Shi, **Yikang LI**, Yu Qiao, *Arxiv Preprint*
- **Bi3D: Bi-domain Active Learning for Cross-domain 3D Object Detection**, Jiakang Yuan, Bo Zhang, Xiangchao Yan, Tao Chen, Botian Shi, **Yikang LI**, Yu Qiao, *CVPR 2023*

General Vision and Language Research

- β**-DARTS: Beta-Decay Regularization for Differentiable Architecture Search**, Peng Ye, Baopu Li, **Yikang LI**, Tao Chen, Jiayuan Fan, Wanli Ouyang, *CVPR 2022 (Oral)*
- **PasteGAN: A Semi-Parametric Method to Generate Image from Scene Graph**, **Yikang LI**, Tao Ma, Yeqi Bai, Nan Duan, Sining Wei, Xiaogang Wang, *NeurIPS 2019*
- **Disentangling Pose from Appearance in Monochrome Hand Images**, **Yikang LI**, Chirs Twigg, Yuting Ye, Lingling Tao, Xiaogang Wang, *ICCV-W 2019*
- **Perceive Where to Focus: Learning Visibility-aware Part-level Features for Re-ID**, Yifan Sun, Yali Li, Qin Xu, Chi Zhang, **Yikang LI**, Shengjin Wang, Jian Sun, *CVPR 2019*
- **Factorizable Net: An Efficient Framework for Scene Graph Generation**, **Yikang LI**, Wanli Ouyang, Bolei Zhou, Jianping Shi, Chao Zhang, Xiaogang Wang, *ECCV 2018*
- **Question-Guided Hybrid Convolution for Visual Question Answering**, Peng Gao, Hongsheng Li, Shuang Li, Pan Lu, **Yikang Li**, Steven C.H. Hoi, Xiaogang Wang, *ECCV 2018*
- **Visual Question Generation as Dual Task of Visual Question Answering**, **Yikang LI**, Nan Duan, Bolei Zhou, Xiao Chu, Wanli Ouyang, Xiaogang Wang, Ming Zhou, *CVPR 2018* Spotlight
- **Semantically Consistent Image Completion with Fine-grained Details**, Pengpeng Liu, Xiaojuan Qi, Pinjia He, **Yikang LI**, Michael R. Lyu, Irwin King, *arXiv preprint*
- **Scene Graph Generation from Objects, Phrases and Caption Regions**, **Yikang LI**, Wanli OUYANG, Xiaogang WANG, Bolei ZHOU, Kun WANG, *ICCV 2017*
- **ViP-CNN: Visual Phrase Guided Convolutional Neural Network**, **Yikang LI**, Wanli OUYANG, Xiaogang WANG, Xiaoou TANG, *CVPR 2017*