Kaicheng Yu

SENIOR RESEARCH SCIENTIST, DAMO ACADEMY, ALIBABA GROUP

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Short Bio

Dr. Kaicheng Yu's research interests cover broader area of computer vision, machine learning, and artificial intelligence, with special emphasis on building intelligent visual systems. He receives Westlake Star Award (Young Talent Program) at 2022, Qualcomm Innovation Fellowship Europe at 2019, and has been recognized as outstanding reviewer at ECCV2020 and CVPR2021.

He has published more than 15 papers on top conference venues like CVPR, ICCV, ECCV, ICML, ICLR and NeurIPS, and journals like TPAMI. His works have been cited over 600 times, one of his first-authored papers has been cited over 300 times and opens a new research direction in neural architecture search. After joining Alibaba as a senior applied research scientist on September 2021, he builds a research team with seven members, where five among those are PhD students from top universities in China, like Tsinghua and Peking University and is in charge of five Alibaba Innovation Research (AIR) projects.

His ultimate research goal is to build a system that incorporate the automatic machine learning to evolve with human in the loop feed-back to achieve generic 3D perception across multi-modalities for robotic vision system. Specifically, his works includes:
- Towards robust 3D perception in autonomous driving scenarios in Bird's Eye View fashion and cross modality 3D generation;
- Automatically improves the performance of neural architectures, including neural architecture search, active learning and lifelong learning.

Education

École Polytechnique Fédérale de Lausanne (EPFL)
Lausanne, Switzerland

PhD in Information and Communication
Sept 2016 - Aug 2021

- *Advisor*: Pascal Fua, *Co-advisor*: Mathieu Salzmann; Recipent of IC Fellowship
- *Thesis*: From Human-Designed Convolutional Neural Networks Towards Robust Neural Architecture Search
- *Committee*: Pascal Fua, Mathieu Salzmann, Martin Jaggi, Nicolas Lane, Yangqing Jia

University of Hong Kong
Hong Kong

Bachelor of Engineering (B.Eng.) in Computer Science
Sept 2012 - July 2016

- Graduated with First-class Honor Distinction

Academic Honors and Awards

Year	Award	Location
2023	**Hangzhou Westlake Star Youth Talent**, Winner	*Hangzhou, China*
2021	**Alibaba Star Talent Program**, Top 0.1% of class 2021 recruits (3 PhD globally), starts with senior position	*Worldwide*
2019	**Qualcomm Innovation Fellowship**, Winner, 4 PhD Student, Worldwide, prize USD40,000	*Worldwide*
2021	**Outstanding Reviewer Award**, CVPR	*Worldwide*
2020	**Outstanding Reviewer Award**, ECCV	*Worldwide*
2016	**PhD IC Fellowship**, IC School, EPFL	*Switzerland*
2016	**Best poster award of Undergraduates**, Hong Kong University	*Hong Kong*
2016	**First Class Honor**, Hong Kong University	*Hong Kong*
2015	**Undergraduate Research Fellowship**, Hong Kong University	*Hong Kong*
2012	**Soong Ching Ling Hong Kong Scholarship**, China Soong Ching Ling Foundation	*Shandong, China*

Academic Experience

Autonomous Driving Lab, DAMO Academy, Alibaba Group
Hangzhou, China

Senior Research Scientist
Sept 2021 - Present

- Build and lead the research team in perception division, which has 6 PhD interns and 2 full-time members.
- Design a perception system that automatically learns, corrects and improves in a fully automated manner with components of neural architecture search, active learning and 3D sensor simulations with neural implicit representations.

Abacus AI
San Francisco, USA

Research Scientist
May 2021 - Sept 2021

Intelligent System Lab, Intel
Munich, Germany

PhD Research Intern
May 2019 - Feb 2020

SwissCom AI Lab
Lausanne, Switzerland

Research Assistant
Sept 2017 - Aug 2018

Publications

Equal contribution *; Supervised intern †

Section A: *Towards robust 3D perception in autonomous driving scenarios*

BEVFusion: A Simple and Robust LiDAR-Camera Fusion Framework *NeurIPS 2022*
- *Tingting Liang*†, Hongwei Xie*, **Kaicheng Yu***, Zhongyu Xia, Zhiwei Lin, Yongtao Wang, Tao Tang, Bing Wang, Zhi Tang*

BEVHeight: A Robust Framework for Vision-based Roadside 3D Object Detection *CVPR 2023*
- *Lei Yang†, **Kaicheng Yu**, Tao Tang, Jun Li, Kun Yuan, Li Wang, Xinyu Zhang, Peng Chen*

Benchmarking the Robustness of LiDAR-Camera Fusion for 3D Object Detection *CVPR2023 Workshop*
- ***Kaicheng Yu**, Tang Tao, Hongwei Xie, Zhiwei Lin, Zhongwei Wu, Zhongyu Xia, Tingting Liang, Haiyang Sun, Jiong Deng, Dayang Hao, Yongtao Wang, Xiaodan Liang, Bing Wang*

Painting 3D Nature in 2D: View Synthesis of Natural Scenes from a Single Semantic Mask *CVPR 2023*
- *Shangzhan Zhang†, Sida Peng, Tianrun Chen, Linzhan Mou, **Kaicheng Yu**, Yiyi Liao, Xiaowei Zhou, Haotong Lin*

LiDAR-NeRF *ICCV 2023 (in submission)*
- *Tao Tang†, Longfei Gao, Guangrun Wang, Peng Chen, Dayang Hao, Xiaodan Liang, Mathieu Salzmann, **Kaicheng Yu***

Section B: *Automatically improves the performance of neural architectures*

An Analysis of Super-Net Heuristics in Weight-Sharing NAS *TPAMI 2022*
- ***Kaicheng Yu**, Rene Ranftl, Mathieu Salzmann*

Evaluating the Search Phase of Neural Architecture Search *ICLR 2020*
- ***Kaicheng Yu***, Christian Sciuto*, Martin Jaggi, Claudiu Musat, Mathieu Salzmann*

Overcoming Multi-Model Forgetting *ICML 2019*
- *Yassine Benyahia*†, **Kaicheng Yu***, Kamil Bennani-Smires, Martin Jaggi, Anthony Davison, Mathieu Salzmann, Claudiu Musat*

Landmark Regularization: Ranking Guided Super-Net Training in Neural Architecture Search *CVPR 2021*
- ***Kaicheng Yu**, Rene Ranftl, Mathieu Salzmann*

Statistically-motivated Second-order Pooling *ECCV 2018*
- ***Kaicheng Yu**, Mathieu Salzmann*

Recurrent U-Net for Resource-Constrained Segmentation *ICCV 2021*
- *Wei Wang*, **Kaicheng Yu***, Joachim Hugonot, Pascal Fua, Mathieu Salzmann*

NAS-Bench-Suite: NAS Evaluation is (Now) Surprisingly Easy *ICLR 2021*
- *Yash Mehta, Colin White, Arber Zela, Arjun Krishnakumar, Guri Zabergja, Shakiba Moradian, Mahmoud Safari, **Kaicheng Yu**, Frank Hutter*

Pyramid Architecture Search for Real-Time Image Deblurring *ICCV 2021*
- *Xiaobin Hu, Wenqi Ren, **Kaicheng Yu**, Kaihao Zhang, Xiaochun Cao, Wei Liu, Bjoern Menze, TU Munchen*

Semantic-DARTS: Elevating Semantic Learning for Differentiable Architecture Search *ICCV 2023 (in submission)*
- *Bicheng Guo, Shuxuan Guo, Miaojing Shi, Peng Chen, Shibo He, Jiming Chen, **Kaicheng Yu***

Learning Self-Regularized Adversarial Views for Self-Supervised Vision Transformers *TPAMI 2023 (in submission)*
- *Tao Tang†, Changlin Li, Guangrun Wang, **Kaicheng Yu**, Xiaojun Chang, Xiaodan Liang*

Knowledge Distillation via the Target-aware Transformer *CVPR 2022, Oral presentation*
- *Sihao Lin†, Hongwei Xie, Bing Wang, **Kaicheng Yu**, Xiaojun Chang, Xiaodan Liang, Gang Wang*

Generalized Class Incremental Learning *CVPR2020 Workshop*
- *Fei Mi, Lingjing Kong, Tao Lin, **Kaicheng Yu**, Boi Faltings*

Second-order Convolutional Neural Networks *Tech Report*
- ***Kaicheng Yu**, Mathieu Salzmann*

Supervised interns

Tingting Liang (Advisor: Yongtao Wang) *PhD Student, Peking University*
- *Topic: Towards robust camera-lidar fusion framework for 3D detection. Incoming research engineer at Alibaba Group*

Tao Tang (Advisor: Xiaodan Liang) *PhD Student, Sun Yet-sen University*
- *Topic: Towards generic 3D understanding via LiDAR point cloud simulation*

Yixing Liao (Advisor: Hengshuang Zhao) *PhD Student, University of Hong Kong*
- *Topic: Overcoming the domain gap via LiDAR point cloud translation with implicit fieldds*

Xiaoyang Wu (Advisor: Hengshuang Zhao)   *PhD Student, University of Hong Kong*
- *Topic: Point Prompt Tuning: Cross dataset 3D indoor scene understanding.*

Shangzhan Zhang (Advisor: Xiaowei Zhou)   *MSc Student, Zhejiang University*
- *Topic: Painting 3D in 2D: Novel view synthesis of natural scenes*

Hu Zhang (Advisor: Xin Yu)   *PostDoc, Queensland University*
- *Topic: Open-world 3D object detection with cross modality features, in preparation of NeurIPS 2023*

Bicheng Guo (Advisor: TODO)   *PhD Student, Zhejiang University*
- *Topic: Detection directly from neural implicit fields.*

Sihao Lin (Advisor: TODO)   *PhD Student, Moonash University*
- *Topic: Knowledge distillation via semantic aware transformer*

Jiqi Zhang (Advisor: Xiaodan Liang)   *MSc Student, Sun Yet-sen University*
- *Topic: Self-supervised learning in point cloud perception.*

Yassine Benyahia (Advisor: Anthony Davison)   *MSc Student, EPFL*
- *Topic: Overcoming multi-model forgetting in neural architecture search*

Christian Sciuto (Advisor: Claudiu Musat)   *MSc student, EPFL*
- *Topic: Benchmarking the robustness of neural architecture search*

Teaching Experiences

2020 Fall	**Introduction to machine learning**, Teaching assistant	*EPFL*
2020 Spring	**Computer vision**, Teaching assistant	*EPFL*
2018 Fall	**Information, Calculation and Communication**, Teaching assistant	*EPFL*
2018 Spring	**System of data science**, Teaching assistant	*EPFL*
2017 Fall	**Information, Calculation and Communication**, Teaching assistant	*EPFL*
2017 Spring	**Information, Calculation and Communication**, Teaching assistant	*EPFL*
2015 Spring	**Object-oriented programming and Java**, Teaching assistant	*University of Hong Kong*
2014 Spring	**Introduction to Electric and Electronics Engineering**, Lab assistant	*University of Hong Kong*

Academic Services

Conference Reviewer: CVPR, ICCV, ECCV, ICML, ICLR, NeurIPS, AAAI, BMVC, ACCV

Journal Reviewer: TPAMI, IJCV, TIP, JMLR