Yicheng Qiao

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Education

Tsinghua University, Beijing,China 03/2023 – 06/2024

Joint Undergraduate Student, School of Vehicle and Mobility, Tsinghua University

Beijing Sport University, Beijing, China 09/2020 – 06/2024

B.Eng. in Data Science and Big Data Technology, GPA: 3.97 / TOEFL: 107

Key grades: Discrete Mathematics (99), Computer Vision (97), Neural Network Design and Programming (97), Applied Statistical Methods (97), Visual Perception and Virtural Reality (96), Python Programming (96)

Research Interest & Plan

The ultimate goal of my research is to create safe and controllable strong AI that contributes to human civilization.

• On the one hand, I am deeply interested in exploring specific applications such as Artificial General Intelligence (AGI), 3D Computer Vision, Large Language and Vision Models, Multimodality Learning and Embodied Intelligence.

• On the other hand, I want to conduct foundational research in AI, focusing on enhancing the transparency and reliability of machine learning models, making them more bio-inspired and intelligent.

Experience

XuLab (Computational Biology Department) Carnegie Mellon University, Pittsburgh

Intern 12/2023 – Present

- Focused on information extraction and modeling of the structures and spatial organizations of macromolecules and their interactions with organelles in single cells captured by cryo electron-tomography 3D images.

State Key Laboratory of Automotive Safety and Energy Tsinghua University, Beijing

Research Assistant 03/2023 – 06/2024

- Led a comprehensive review and served as the main contributor to a principal paper on 4D millimeter-wave radar in autonomous driving.
- Served as the corresponding author and main contributor to a paper on driving style prediction, proposing a novel driving behavior classification network named *FMDNet*.
- Elevated the multi-tasking precision of the AIDE dataset by constructing foundational models and implementing strategic improvements through rigorous research.
- Spearheaded a collaborative research effort with the University of Mining & Technology, leading to a significant publication in Chinese Core Journal.

Remote sensing and Medical imaging with X-features (REMEX) Lab Beijing

Research Assistant 05/2022 – 07/2023

- Proposed the development of *DLAFNet* that efficiently performs semantic segmentation of remote sensing images by leveraging Multispectral images and LiDAR point cloud data.
- Led *SeMask-Mask2Former*, an advanced approach that significantly improved the performance of semantic segmentation in remote sensing images.
- Secured a Chinese patent for a novel method of "Semantic Segmentation Fusion in Remote Sensing using Optical Images and LiDAR Point Clouds."
- Awarded the **First Prize** in the BUPT College Students' Innovation and Entrepreneurship Program Exchange.

Computer Network Information Center of the CAS Chinese Academy of Sciences (CAS)

Intern, Algorithm Engineer, Company of Security Technology 12/2022 – 03/2023

- Implemented the "A Webshell Detection Method Based on Naive Bayes Algorithm."
- Contributed to a patent on "XGBoost-based False Alarm Detection with Automatic Orchestration Response."
- Assisted in deploying the Suricate server and software development tasks.

Publications & Preprints

1 **Yicheng Qiao**, Wei Liu, Bin Liang, Pengyun Wang, Haopeng Zhang and Junli Yang, "SeMask-Mask2Former: A Semantic Segmentation Model for High Resolution Remote Sensing Images," in **IEEE Aerospace Conference**, 2023.[Github] [PDF]

2 Wenzhuo Liu, Jianli Lu, Junbin Liao, **Yicheng Qiao**, Guoying Zhang, Jiayin Zhu, Guoying Zhang, Jiayin Zhu, Bozhang Xu, and Zhiwei Li"FMDNet: Feature-attention-embedding-based Multimodal-fusion Driving-behavior-classification Network," under **review** in IEEE **Transactions** on Computational Social Systems **(TCSS)**, 2024, **Corresponding author**: **Yicheng Qiao**[Github]

3 Wei Liu, He Wang, **Yicheng Qiao**, Junli Yang, Haopeng Zhang, "DLAFNet: Direct LiDAR-Aerial Fusion Network for Semantic Segmentation of 2D Multispectral Aerial Image and 3D LiDAR Point Cloud," under **review** in IEEE Journal Of Selected Topics In Applied Earth Observations And Remote Sensing **(J-STARS),** 2023[Github]

4 Wei Liu, He Wang, **Yicheng Qiao**, Bin Liang, Haopeng Zhang and Junli Yang, "DLAFNET: A Direct Fusion Method Of 2D Aerial Image And 3D Lidar Point Cloud For Semantic Segmentation," in International Geoscience and Remote Sensing Symposium **(IGARSS Oral),** 2023[Github] [PDF]

5 Wenzhuo Liu, **Yicheng Qiao**, Jing Liu, Yongqi Gan, Zongze Li and Guoying Zhang, "Froth edge segmentation in flotation images," in NONFERROUS METALS Mineral Processing Section, 2023

6 Li Wang, Xinyu Zhang, **Yicheng Qiao**, Chuze Wu, Ziying Song, Lei Yang and Jun Li, "Research on 4D Imaging Radar Sensing Technology for Autonomous Driving," under **review** in AUTOMOTIVE ENGINEERING, 2023

7 Mingyan Yin, **Yicheng Qiao**, Dexiao Long Zhang, Jiashun Guo, Minyi Zhu, Can Wang, "Data Augmentation Based on Style Transfer," in Information Technology and Informatization, Issue 11, 2023

- **Coming Work: Yicheng Qiao** is currently writing and plans to submit a paper to IEEE Transactions on Intelligent Transportation Systems (T-ITS) and a conference paper to CVPR/AAAI.

Selected Awards

- Mathematical Contest In Modeling (MCM) Meritorious Winner 2022
- Second Prize in China Computer Design Competition for University Students 2022
- Silver Prize as team leader, National "Chuangyi Cup" Innovation and Entrepreneurship Competition 2022
- Bronze Prize as team leader, "Challenge Cup" Capital University Student Entrepreneurship Competition 2022
- National Encouragement Scholarship (top5%) 2021 - 2023
- Merit Student (top5%) 2021 - 2023

Selected Projects

Data Augmentation Based on Style Transfer Intercollegiate Cooperation

Main Contributor 06/2022 – 06/2023

- Led the implementation of neural transfer algorithms, from Traditional to Neural Style Transfer.
- Authored "Data Augmentation Based on Style Transfer" for "Information Technology and Informatization."
- Recognized for **excellence** in the 2022 Beijing University Student Innovation and Entrepreneurship Training Interschool Cooperation Plan.

Research on Intelligent Perception of Sports Scenes Based on 3D Computer Vision Undergraduate Thesis

Sole Author 06/2023 – 06/2024

- Introduced an innovative approach to 3D reconstruction of dynamic entities within the sports domain.
- Utilized the advantages of the SAM in 2D imaging for masks, further achieving segmentation in 3D.
- Developed a custom dataset and optimized NeRF for enhanced methodology.

Evergreen Tree - Value Redevelopment Project for Retired Athletes Intercollegiate Cooperation

Project Leader 11/2021 – 05/2022

- Managed a team of over ten university students, coordinating tasks and arrangements.
- Developed the official website and mini-program for Evergreen Tree.
- Recognized as a **national-level** college student innovation program and selected as an **excellent case** in the Beijing University Student Innovation and Entrepreneurship Training Program.

Skills

Languages: Mandarin (native), TOEFL(107)
Programming Languages: Python, C/C++, HTML/CSS, JavaScript, R, Java, Bash (ranked by proficiency)
Tools and Frameworks: PyTorch, TensorFlow, LaTeX, CloudCompare, Matlab, Stata, Hadoop, NoSQL, Tableau, Docker, Git