Yicheng Qiao

yichengqiao21@gmail.com GitHub Homepage Google Scholar Twitter

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: **3.83**/4.0 (WES), **3.97**/5.0 (Official)
Key grades: Discrete Mathematics (99), Computer Vision (97), Neural Network Design and Programming (97), Statistical Methods and Data Analysis (97), Visual Perception and Virtural Reality (96), Python Programming (96)

Research Experience

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

Research Assistant 03/2023 – 12/2024

- Authored and led research on driving style prediction, introducing the novel driving behavior classification network *FMDNet*, published in *IEEE Transactions on Computational Social Systems (TCSS)*.
- Led the development of *MMTL-UniAD*, showcased at **CVPR2025**, by integrating a multi-axis attention network with dual-branch multimodal embeddings to effectively resolve task conflicts.
- Developed *UDM-Net*, incorporating PMANet and RDF methods to optimize feature extraction and fusion, with its robust multi-task performance demonstrated in the *IEEE Transactions on Intelligent Transportation Systems*.
- Pioneered *SAMOccNet*, the first occupancy network to integrate the Segment Anything Model (SAM), enhancing predictions through a residual attention mechanism and validated on the nuScenes-Occupancy dataset.

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.
- Awarded the **First Prize** in the BUPT College Students' Innovation and Entrepreneurship Program Exchange.

XuLab, Carnegie Mellon University Pittsburgh

Intern, Computational Biology Department 12/2023 – 02/2024

- Worked collaboratively using Slack to complete tasks related to biomedical image recognition and 3D reconstruction during the internship.

Publicaions (Incl. Conference, Journal and Chinese Core Journal)

C1 Liu, W., Wang, W., **Yicheng Qiao**, Guo, Q., Zhu, J., Li, P., Chen, Z., Yang, H., Li, Z., Wang, L., Tan, T., Liu, H. "MMTL-UniAD: A Unified Framework for Multimodal and Multi-Task Learning in Assistive Driving Perception," in Conference on Computer Vision and Pattern Recognition **(CVPR)**, 2025,*Main authors.[Github]

C2 Liu, W., **Yicheng Qiao**, Wang, Z., Wang, W., Liu, H. "Time Effcient Multimodal Multi-Task Learning Network for AssistiveDriving" under **review** IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2025.[Github]

C3 **Yicheng Qiao**, Liu, W., Liang, B., Wang, P., Zhang, H. and Yang, J., "SeMask-Mask2Former: A Semantic Segmentation Model for High Resolution Remote Sensing Images," in IEEE Aerospace Conference (AeroConf), 2023.[Github] [PDF]

C4 Liu, W., Wang, H., **Yicheng Qiao**, Liang, B., Zhang, H. and Yang, J., "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]

J1 Liu, W.*, **Yicheng Qiao***, Li, Z., Zhang, W., Zhu, J., Wang, L., Wang, H., Liu, H., and Wang, K., "UDM-Net: Unified Assistive Driving Multi-task Perception Network based on Multimodal Fusion," in IEEE **Transactions** on Intelligent Transportation Systems (T-ITS), 2025,*Co-first authors.(*JCR-Q1*)[Github]

J2 Yang, H.*, Liu, W.*, **Yicheng Qiao***, Li, Z., Wang, W., Tan, T., Liu, H. "CrossRay3D: Geometry and Distribution Guidance for Efficient Cross-Modal 3D Detection" under **review** IEEE **Transactions** On Circuits And Systems For Video Technoloy **(TCSVT)**, 2025,*Co-first authors.(*JCR-Q1*)

J3 Liu, W., Lu, J., Liao, J., **Yicheng Qiao***, Zhang, G., Zhu, J., Zhang, G., Zhu, J., Xu, B., and Li, Z., "FMDNet: Feature attention embedding based Multimodal fusion Driving behavior classification Network," in IEEE **Transactions** on Computational Social Systems **(TCSS)**, 2024, ***Corresponding author**, (*JCR-Q1*) [Github] [PDF]

J4 Liu, W., Wang, H., **Yicheng Qiao**, Yang, J., Zhang, H., "DLAFNet: Direct LiDAR-Aerial Fusion Network for Semantic Segmentation of 2D Multispectral Aerial Image and 3D LiDAR Point Cloud," in IEEE Journal Of Selected Topics In Applied Earth Observations And Remote Sensing **(J-STARS),**2024 (*JCR-Q1*)[Github][PDF]

J5 Tan, Q., Liu, W., Bi, H., **Yicheng Qiao**, Jiang, Y., Guo, Q., Liu, H., Li, Z., Qiu, C., "SAMOccNet: Refined SAM-based Surrounding Semantic Occupancy Perception for Autonomous Driving," under **review** in NEUROCOMPUTING, 2025 (*JCR-Q1*)

CJ1 Liu, W., **Yicheng Qiao**, Yin, X., Liu, J., Gan, Y., Li, Z., Zhang, G. "Froth edge segmentation in flotation images[J]".Nonferrous Metals(Mineral Processing Section),2024(4):67-76.

CJ2 Yin, M., **Yicheng Qiao**, Zhang, D., Guo, J., Zhu, M., Wang, C., "Data Augmentation Based on Style Transfer," in Information Technology and Informatization, Issue 11, 2023

Patents

- A remote sensing semantic segmentation method based on the fusion of optical images and LiDAR point clouds. CN Patent Application 202310312734.2, filed March 28, 2023. Patent Pending (co-inventor).
- A 3D semantic occupancy perception method and device for complex environments. CN Patent Application 202410-858652.2, filed June 28, 2024. Patent Pending (co-inventor).

Selected Awards

- Merit Student (top5%) 2021 - 2023
- National Encouragement Scholarship (top5%) 2021 - 2023
- 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

Projects and Work Experience

3D Reconstruction and Segmentation based on Large Vision Models using 3DGS and NeRF

Undergraduate Thesis 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.

ReplyKey: AI Reply Keyboard Entrepreneurship Program

Machine Learning Engineer 12/2024 – 01/2025

- Designed and implemented a scalable backend framework for cloud-based AI services on AWS.
- Developed comprehensive LLM response templates and writing tool prompts aligned with the latest APPLE Intelligent Prompts standards to enhance user interactions.
- Engineered and deployed AI agents with diverse response personas using Coze.

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.

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

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

- designed and implemented machine learning algorithms for the company, including developing a webshell detection method and contributing to a patent.

Skills

Languages: Mandarin (native), English (CEFR C1 / TOEFL: 107)
Programming Languages: Python, C/C++, Bash, HTML/CSS, JavaScript, R(ranked by proficiency)
Tools and Frameworks: PyTorch, TensorFlow, LaTeX, CloudCompare, Matlab, Stata, Hadoop, NoSQL, Tableau, Docker, Git