Qingyuan Liu

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Education

- **Columbia University in the City of New York** *Sep. 2023 – May 2025*
  Master of Science in Computer Engineering New York, USA
  ◦ Overall GPA: 3.92/4.00

- **Huazhong University of Science and Technology** *Sep. 2019 – Jul. 2023*
  Bachelor of Engineering in Computer Science and Technology Wuhan, China
  ◦ Overall GPA: 3.75/4.00, Last 2 Years GPA: 3.90/4.00

Publications

*Equal Contribution, C=Conference, S=In Submission

[S.1] **Qingyuan Liu***, Jiachen Gu*, Yunzhi Yao, Hong Wang, and Nanyun Peng. **Energy-Regularized Sequential Model Editing on Hyperspheres**. In submission to *The Fourteenth International Conference on Learning Representations* **(ICLR)**. 2026.

[S.2] **Qingyuan Liu**, Yun-Yun Tsai, Ruijian Zha, Pengyuan Shi, Victoria Li and Junfeng Yang. **LAVID: An Agentic LVLM Framework for Diffusion-Generated Video Detection**. arXiv Preprint. 2025

[C.1] Baohua Yan, **Qingyuan Liu**, Zhaobin Mo, Kangrui Ruan, Xuan Di. **Balanced Latent Space of Diffusion Models for Counterfactual Generation**. In *The Thirteenth International Conference on Learning Representations Deep Generative Model in Machine Learning: Theory, Principle and Efficacy Workshop* **(ICLR DeLTa)**. 2025

[C.2] **Qingyuan Liu**, Pengyuan Shi, Yun-Yun Tsai, Chengzhi Mao, and Junfeng Yang. **Turns Out I'm Not Real: Towards Robust Detection of AI-Generated Videos**. In *IEEE / CVF Computer Vision and Pattern Recognition Conference 2024,* **(CVPR GenAI)**. ***Columbia Engineering Research Highlight***

[C.3] Zhaobin Mo*, **Qingyuan Liu***, Baohua Yan, Longxiang Zhang, and Xuan Di. **Causal Adjacency Learning for Spatiotemporal Prediction Over Graphs**. In *Proceeding of 27th IEEE International Conference on Intelligent Transportation Systems* **(ITSC)**. 2024

[C.4] **Qingyuan Liu**, Yuxuan Zhou, and Shuai Bao. **Accurate Face Swap using CycleGAN**. In *International Conference on Cloud Computing, Internet of Things, and Computer Applications* **(CICA)**. 2022

Honors and Awards

- **Columbia Engineering Research Highlight** *2024*
  Columbia University [🌐]
- **2024 Spring MS Honors Students (Top 3)** *2024*
  Columbia University [🌐]
- **Advanced Master Research Student** *2024*
  Columbia University
- **National Second Prize (Top 3%) in the China Collegiate Computing Contest-Network Technology Challenge (C4)** *2023*
  Computer Education Research Association of Chinese Universities

Research Experience

- **PLUSLAB [🌐], University of California, Los Angeles** *Jan. 2025 – Present*
  Research Assistant advised by Prof. Nanyun (Violet) Peng Los Angeles, USA
  ◦ ***Pr. 1: Energy-Regularized Sequential Model Editing on Hyperspheres***: Developed the SPHERE (Sparse Projection for Hyperspherical Energy Regularized Editing), providing theoretical proof of the link between hyperspherical uniformity and editing stability, extending the boundary of reliable large-scale model editing.

- **VLAA LAB [🌐], University of California, Santa Cruz** *May 2025 – Present*
  Research Assistant advised by Prof. Yuyin Zhou Santa Cruz, USA
  ◦ ***Pr. 1: Unified Vision-Language Foundation Model for Brain MRI Interpretation***: Built multi-modal foundation models for 3D brain imaging (MRI, CT, clinical data) with strong generalization to downstream tasks such as QA, reporting, segmentation, and classification, bridging research and clinical deployment.

- **DitecT Lab [🌐], Columbia University** *Sep. 2023 – Present*
  Research Assistant advised by Prof. Xuan (Sharon) Di New York, USA
  ◦ ***Pr. 1: Causal Adjacency Learning for Spatiotemporal Prediction Over Graphs***: Designed the CAL framework, enhancing prediction performance on the ODD dataset and achieving up to 50.3% RMSE improvement on the SafeGraph dataset compared with distance, correlation, and attention-based baselines.

- ***Pr. 2: Balanced Latent Space of Diffusion Models for Counterfactual Generation***: Proposed a controllable diffusion generation framework that balances latent space via guiding signals, enabling generation of counterfactual data while preserving factual consistency.

- **Software Systems Laboratory [🌐], Columbia University** *Sep. 2023 – May 2025*
  Research Assistant advised by Prof. Junfeng Yang New York, USA
  - ***Pr. 1: Turns Out I'm Not Real: Towards Robust Detection of AI-Generated Videos***: Developed the DIRE method for detecting AI-generated videos using temporal information from video generation models, achieving up to 93.7% accuracy on datasets including Stable Video Diffusion, Sora, Pika, and Gen-2.
  - ***Pr. 2: LAVID: An Agentic LVLM Framework for Diffusion-Generated Video Detection***: Designed LAVID, an agentic framework leveraging LVLMs with external tool calls for AI-generated video detection, improving F1 score by 6.2%–30.2% across four state-of-the-art LVLMs.

- **Department of Computer Science, Illinois Institute of Technology [🌐]** *May 2021 – Mar. 2022*
  Research Assistant advised by Prof. Binghui (Alan) Wang Remote
  - ***Pr. 1: Robust Node Injection Attack in Graph Neural Networks***: Designed a node-injection attack with low inter-perturbation correlation using DeepWalk to filter correlated injected nodes, improving robustness while retaining comparable effectiveness against common defenses.

- **School of Computing, National University of Singapore [🌐]** *Apr. 2021 – Oct. 2021*
  Research Assistant advised by Prof. Anand Bhojan Singapore
  - ***Pr. 1: NUS School of Computing Summer Workshop 2021***: Developed a multi-factor spatio-temporal GNN to predict stock market trends using Tushare and Yahoo data, and implemented web crawlers for sentiment and corporate relation data collection.

Projects on Hardware

- **Bubble Bobble Game on Embedded Systems** *Jan. 2024 – May 2024*
  Tools: Verilog, DE1-SoC, Quartus Prime, ARM DS-5 Debugger, libusb, WM8731 Audio CODEC [🐙]
  - Implemented a Bubble Bobble game on DE1-SoC using ARM for game logic and FPGA for video/audio; integrated VGA, USB controller, and audio codec. **Ranked 1st in CSEE4840 Embedded Systems at Columbia.**

- **5G Network Slicing System and Strategy for End Users** *Apr. 2024 – Sep. 2024*
  Tools: Android Studio, VMware, ICMP, Linux Traffic Control (tc)
  - Developed a 5G network slicing framework with optimized strategy; validated on 12 Android devices, achieving +69.4% throughput and +82.2% document transfer efficiency. **National Second Prize (Top 3% of 1006 teams worldwide)** in China Collegiate Computing Contest.

- **Microprocessor without Interlocked Pipeline Stages (MIPS) CPU Design** *Sep. 2021 – Nov. 2021*
  Tools: Logisim, Verilog, MIPS Assembly
  - Designed a MIPS-based CPU from scratch on Logisim, integrating pipeline stalling and branch history table for hazard resolution.

Additional Information

Languages: Chinese (Native level), English (Proficiency level)
Programming Languages: C/C++, Python, Java, SQL, Matlab, HTML/CSS
Packages: Pytorch, Huggingface, Tensorflow/Keras, WandB, Diffusers, OpenCV, Sklearn, Matplotlib, Seaborn