Qingyuan Liu

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EDUCATION

Columbia University in the City of New York (CU)   **09/2023—05/2025**
Master of Science in Computer Engineering (Expected)   GPA: 3.94/4.0 (Top 3)
Honor: 2024 Spring MS Honors Students, Columbia Engineering Research Highlight, Advanced Master Research Student

Huazhong University of Science and Technology (HUST)   **09/2019—07/2023**
Bachelor of Engineering in Computer Science and Technology   GPA: 3.75/4.0
Honor: National Second Prize in the China Collegiate Computing Contest-Network Technology Challenge (C4)

PUBLICATIONS (* indicates equal contributions)

- **Qingyuan Liu**, Yun-Yun Tsai, Ruijian Zha, Pengyuan Shi, Victoria Li and Junfeng Yang "LAVID: An Agentic LVLM Framework for Diffusion-Generated Video Detection", IEEE / CVF International Conference on Computer Vision (**ICCV**), 2025, under review.
- Baohua Yan, **Qingyuan Liu**, Zhaobin Mo, Kangrui Ruan, Xuan Di "Balanced Latent Space of Diffusion Models for Counterfactual Generation" International Conference on Learning Representations (ICLR) Deep Generative Model in Machine Learning: Theory, Principle and Efficacy Workshop, 2025
- **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", IEEE / CVF Computer Vision and Pattern Recognition Conference (**CVPR**) Generative Models for Computer Vision Workshop, 2024, *CU Research Highlight*
- 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
- **Qingyuan Liu**, Yuxuan Zhou, and Shuai Bao "Accurate face swap using cycleGAN", Proc. SPIE 12303, International Conference on Cloud Computing, Internet of Things, and Computer Applications (**CICA**), 2022

RESEARCH EXPERIENCES

Software Systems Laboratory, Columbia University   **New York, USA**
Towards Robust Detection of AI-Generated Videos   **09/2023—04/2025**
Research Assistant advised by Prof. Junfeng Yang (CU)

- *Pr. 1: Turns Out I'm Not Real: Towards Robust Detection of AI-Generated Videos*
  - Developed Diffusion Reconstruction Error (DIRE) based method to detect AI-generate videos; applied video generation model as reconstruction model of video DIRE which took temporal information into account; achieved a detection accuracy of up to 93.7% for videos from their benchmark dataset of videos generated from Stable Vision Diffusion, Sora, Pika, and Gen-2.
- *Pr. 2: LAVID: An Agentic LVLM Framework for Diffusion-Generated Video Detection*
  - Designed an agentic framework LAVID that leverage Large Vision Language Models (LVLMs) in detecting AI-generated videos. The LVLMs will call external tools to extract additional information from the video to facilitate themselves in the detection. Evaluation results show LAVID improves F1 score by 6.2% to 30.2% over the top baseline on the comprehensive dataset across four SOTA LVLMs.

DitecT Lab, Columbia University   **New York, USA**
Towards Generalizable and Robust Graph Machine Learning   **09/2023—04/2025**
Research Assistant advised by Prof. Sharon Di (CU)

- *Pr. 1: Causal Adjacency Learning for Spatiotemporal Prediction Over Graphs*
  - Designed the Causal Adjacency Learning (CAL) framework, enhancing model prediction performance on the ODD dataset; applied with the heuristic method which contained the correlation calculation and Condition Independence Test; achieved 14.23%, 15.49%, and 50.27% RMSE improvement in

SafeGraph dataset, compared with the results based on distance, correlation, and attention matrix separately.

- ○ *Pr. 2: Graph Out-of-Distribution Generalization via Counterfactual Augmentations*
  - Used the gradient of the counterfactual classifier to interfere with the sampling process of the diffusion model, thus generating diversified datasets. The model trained on the counterfactual dataset is expected to be more generalizable.

BAIR Lab, University of California, Berkeley   **Remote**
Causal Inference of LLMs in the Mixture of Experts System   **03/2024—08/2024**
Research Assistant advised by Prof. Jiantao Jiao (Berkeley)

- ○ Applied causal inference to identify the specific layers in LLMs that influence their coding capabilities. Evaluated the causal components of LLMs across various tasks, including reasoning and memory tasks. Developed a method to integrate coding abilities by combining layers from multiple agents.

Department of Computer Science, Illinois Institute of Technology   **Remote**
Robust Node Injection Attack in Graph Neural Network   **05/2021—03/2022**
Research Assistant advised by Prof. Binghui (Alan) Wang (IIT)

- ○ Designed a Node Injection Attack with low correlation between perturbation. DeepWalk used here to measure the correlation between the injected nodes. Then filter the highly correlated injected nodes to increase the robustness of the attack. Experiments demonstrate that the attack retains a comparable level of perturbation even after applying defensive methods.

School of Computing, National University of Singapore   **Singapore**
NUS School of Computing (SOC) Summer Workshop 2021   **04/2021—08/2021**
Research Assistant advised by Prof. Anand Bhojan (NUS)

- ○ Designed a multi-factor spatio-temporal GNN to predict stock market trends using the information from Tushare and Yahoo; implemented web crawlers for collecting sentiment analysis and corporate relations.

SELECTED PROJECTS

Bubble Bobble Game   **01/2024—05/2024**
Course Project of CSEE4840 Embedded Systems, CU (Rated 1st)   Supervisor: Prof. Stephen A. Edwards(CU)

- ● Designed and implemented bubble bobble game on an embedded system utilizing both the ARM CPU and the FPGA on the DE1-SoC, with a focus on efficient video and audio processing. The system is based on line buffer, integrating various hardware inputs of VGA, Game Controller, Audio Jack, and Keyboard.

Research on 5G Network Slicing System and Strategy for End Users   **04/2022—09/2022**
National Second Prize (Top 3% out of 1006 teams worldwide) in C4   Supervisor: Prof. Chen Yu (HUST)

- ● Applied Reinforcement Learning method to optimize network slicing strategy; tested strategy with 12 cellphones, increasing network throughput by 69.4% and document transfer efficiency by 82.2%.

Microprocessor without Interlocked Pipeline Stages (MIPS) CPU Design   **09/2021—10/2021**
Course project of Computer Organization Experiment   Supervisor: Prof. Diqing Hu (HUST)

- ● Designed a CPU from the scratch with MIPS framework on the Logisim platform; Practical structures have been integrated here such as Pipeline Stalling and Brach History table.

EXTRACURRICULAR ACTIVITIES

- ● **Class President**

  Organized class networking events for 30+ classmates with academia and industries, including Toyota and research laboratories at HUST; Led the class in participating in various activities like the college singing competition.

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK

NAME: Qingyuan Liu
SSN#: XXX-XX-4587
SCHOOL: FU FOUNDATN SCHL OF ENGINEERING & APPLIED SCIENCE:GRAD

CANDIDACY: Master of Science
MAJOR: COMPUTER ENGINEERING
TRACK: ADVANCED MASTERS RESEARCH TRACK

PROGRAM TITLE: COMPUTER ENGINEERING

SUBJECT		COURSE NUMBER	TITLE	POINTS	GRADE	
			Fall 2023			
COMS	E	6901	PROJECTS IN COMPUTER SCIE	3.00	A	
CSEE	W	4119	COMPUTER NETWORKS	3.00	A-	
CSEE	E	6863	FORMAL VERIF HW SW SYSTEM	3.00	A	
EECS	E	6893	TPC:BIG DATA ANALYTICS	3.00	A-	
ENGI	E	4000	PDL FOR COMPUTER ENG	0.00	P	
				GPA	3.835	
			Spring 2024			
CIEN	E	9101	CIVIL ENGINEERING RESEARC	3.00	A+	
COMS	W	4111	INTRODUCTION TO DATABASES	3.00	A	
COMS	E	6901	PROJECTS IN COMPUTER SCIE	3.00	A	
CSEE	W	4840	EMBEDDED SYSTEMS	3.00	A+	
				GPA	4.165	
			Summer 2024			
ENGI	E	4250	SUMMER ATSEAS RESEARCH PR	0.00		
			Fall 2024			
CSEE	W	6180	MODELING & PERFORMANCE EV	3.00	A-	
EECS	E	4764	IOT - INTELLIG & CONNECTED SYS	3.00	B	
ENGI	E	4990	ADVANCED MASTER͡S RESEARC	6.00	A+	
				GPA	3.832	
			Spring 2025			
COMS	E	6901	PROJECTS IN COMPUTER SCIE	6.00		
ENGI	E	4990	ADVANCED MASTER͡S RESEARC	6.00		

REMARKS

Cumulative GPA: 3.944

This official transcript was produced on
APRIL   13, 2025.

SEAL OF COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

Barry S. Kane
Associate Vice President and University Registrar

Columbia College, Engineering and Applied Science, General Studies, Graduate School of Arts and Sciences, International and Public Affairs, Library Service, Human Nutrition, Nursing, Occupational Therapy, Physical Therapy, Professional Studies, Special Studies Program, Summer Session
A, **B**, **C**, **D**, **F** (excellent, good, fair, poor, failing). NOTE: Plus and minus signs and the grades of **P** (pass) and **HP** (high pass) are used in some schools. The grade of **D** is not used in Graduate Nursing, Occupational Therapy, and Physical Therapy.

American Language Program, Center for Psychoanalytic Training and Research, Journalism
P (pass), **F** (failing). Grades of **A**, **B**, **C**, **D**, **P** (pass), **F** (failing) — used for some offerings from the American Language Program Spring 2009 and thereafter.

Architecture
HP (high pass), **P** (pass), **LP** (low pass), **F** (failing), and **A**, **B**, **C**, **D**, **F** — used June 1991 and thereafter **P** (pass), **F** (failing) — used prior to June 1991.

Arts
P (pass), **LP** (low pass), **F** (fail). **H** (honors) used prior to June 2015.

Business
H (honors), **HP** (high pass), **P1** (pass), **LP** (low pass), **P** (unweighted pass), **F** (failing); plus (+) and minus (-) used for H, HP and P1 grades Summer 2010 and thereafter.

College of Physicians and Surgeons
H (honors), **HP** (high pass), **P** (pass), **F** (failing).

College of Dental Medicine
H (honors), **P** (pass), **F** (failing).

Law
A through **C** [plus (+) and minus (-) with **A** and **B** only], **CR** (credit - equivalent to passing). **F** (failing) is used beginning with the class which entered Fall 1994. Some offerings are graded by **HP** (high pass), **P** (pass), **LP** (low pass), **F** (failing). **W** (withdrawn) signifies that the student was permitted to drop a course, for which he or she had been officially registered, after the close of the Law School's official Change of Program (add/drop) period. It carries no connotation of quality of student performance, nor is it considered in the calculation of academic honors.
E (excellent), **VG** (very good), **G** (good), **P** (pass), **U** (unsatisfactory), **CR** (credit) used from 1970 through the class which entered in Fall 1993.

Any student in the Law School's Juris Doctor program may, at any time, request that he or she be graded on the basis of Credit-Fail. In such event, the student's performance in every offering is graded in accordance with the standards outlined in the school's bulletin, but recorded on the transcript as Credit-Fail. A student electing the Credit-Fail option may revoke it at any time prior to graduation and receive or request a copy of his or her transcript with grades recorded in accordance with the policy outlined in the school bulletin. In all cases, the transcript received or requested by the student shall show, on a cumulative basis, all of the grades of the student presented in single format – i.e., all grades shall be in accordance with those set forth in the school bulletin, or all grades shall be stated as Credit or Fail.

Public Health
A, **B**, **C**, **D**, **F** - used Summer 1985 and thereafter. **H** (honors), **P** (pass), **F** (failing) — used prior to Summer 1985.

Social Work
E (excellent), **VG** (very good), **G** (good), **MP** (minimum pass), **F** (failing).
A though **C** is used beginning with the class which entered Fall 1997. Plus signs used with **B** and **C** only, while minus signs are used with all letter grades. The grade of **P** (pass) is given only for select classes.

OTHER GRADES USED IN THE UNIVERSITY

AB = Excused absence from final examination.

AR = Administrative Referral awarded temporarily if a final grade cannot be determined without additional information.

AU = Audit (auditing division only).

CP = Credit Pending. Assigned in graduate courses which regularly involve research projects extending beyond the end of the term. Until such time as a passing or failing grade is assigned, satisfactory progress is implied.

F* = Course dropped unofficially.

IN = Work Incomplete.

MU = Make-Up. Student has the privilege of taking a second final examination.

R = For the Business School: Indicates satisfactory completion of courses taken as part of an exchange program and earns academic credit.

R = For Columbia College: The grade given for course taken for no academic credit, or notation given for internship.

R = For the Graduate School of Arts and Sciences: By prior agreement, only a portion of total course work completed. Program determines academic credit.

R = For the School of International and Public Affairs: The grade given for a course taken for no academic credit.

UW = Unofficial Withdrawal.

UW = For the College of Physicians and Surgeons: Indicates significant attempted coursework which the student does not have the opportunity to complete as listed due to required repetition or withdrawal.

W = Withdrew from course.

YC = Year Course. Assigned at the end of the first term of a year course. A single grade for the entire course is given upon completion of the second term. Until such time as a passing or failing grade is assigned, satisfactory progress is implied.

OTHER INFORMATION

NOTE: All students who cross-register into other schools of the University are graded in the **A, B, C, D, F** grading system regardless of the grading system of their own school, except in the schools of Arts (prior to Spring 1993) and in Journalism (prior to Autumn 1992), in which the grades of P (pass) and F (failing) were assigned. Notations at the end of a term provide documentation of the type of separation from the University.

% of **A**   Effective fall 1996: Transcripts of Columbia College students show the percentage of grades in the **A** (A+, A, A-) range in all classes with at least 12 grades, the mark of **R** excluded. Calculations are taken at two points in time, three weeks after the last final examination of the term and three weeks after the last final of the next term. Once taken, the percentage is final even if grades change or if grades are submitted after the calculation. For additional information about the grading policy of the Faculty of Columbia College, consult the College Bulletin.

KEY TO COURSE LISTINGS
A course listing consists of an area, a capital letter(s) (denotes school bulletin) and the four digit course number (see below).

The **capital letter** indicates the University school, division, or affiliate offering the course:

A	Graduate School of Architecture, Planning, and Preservation
B	School of Business
BC	Barnard College
C	Columbia College
D	College of Dental Medicine
E	School of Engineering and Applied Science
F	School of General Studies
G	Graduate School of Arts and Sciences
H	Reid Hall (Paris)
J	Graduate School of Journalism
K	School of Library Services/Continuing Education (effective Fall 2002)
L	School of Law
M	College of Physicians and Surgeons, Institute of Human Nutrition, Program in Occupational Therapy, Program in Physical Therapy, Psychoanalytical Training and Research
N	School of Nursing

O	Other Universities or Affiliates/Auditing
P	School of Public Health
Q	Computer Technology/Applications
R	School of the Arts
S	Summer Session
T	School of Social Work
TA-TZ	Teachers College
U	School of International and Public Affairs
V	Interschool Course
W	Interfaculty Course
Y	Teachers College
Z	American Language Program

The **first digit** of the course number indicates the level of the course, as follows:

0	Course that cannot be credited toward any degree
1	Undergraduate course
3	Undergraduate course, advanced
4	Graduate course open to qualified undergraduates
5	Graduate course open to qualified undergraduates
6	Graduate course
7	Graduate course
8	Graduate course, advanced
9	Graduate research course or seminar

Note: Level Designations Prior to 1961:
1-99 Undergraduate courses
100-299 Lower division graduate courses
300-999 Upper division graduate courses

The term designations are as follows:
X=Autumn Term, Y=Spring Term, S=Summer Term
Notations at the end of a term provide documentation of the type of separation from the University.