YINGSI QIN

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Education

Ph.D. Electrical and Computer Engineering | **Carnegie Mellon University** | 2021-2026 Pittsburgh, PA
Advisor Aswin C. Sankaranarayanan
Research Interests Computational 3D Display, Virtual Reality, Augmented Reality

B.S. Computer Science | **Columbia University** | 2019-2021 | GPA: 3.98 New York, NY
Focus Intelligence Systems, Deep Learning, Computer Vision

B.A. Physics | **Colgate University** | 2016-2021 | GPA: 3.93 Hamilton, NY
Focus Optics, Physical Modelling

Publications

1. E. J. Galvez, F. J. Auccapuclla, ***Y. Qin***, K.L. Wittler, and J.M. Freedman, “Pendulum Beams: Optical Modes that Simulate the Quantum Pendulum,” *Journal of Optics*, accepted for publication. [pdf]
2. E. J. Galvez, F. J. Auccapuclla, K.L. Wittler, and **Y. Qin**, “Pendulum beams: a window into the quantum pendulum" in *Proc. SPIE, Complex Light and Optical Forces XIII,* 2019*,* 1093509*.* [pdf]
3. E. J. Galvez, F. J. Auccapuclla, **Y. Qin**, and K. L. Wittler, "Simulating Quantum Mechanics with Light: The Quantum Pendulum Via Mathieu Beams," in *Frontiers in Optics APS, Optical Society of America Technical Digest*, 2019, paper JW3A.117. [pdf]

Research Experience

Snap Research | Jun. 2020–Dec. 2020 (Remote) New York, NY
Research Intern, Computational Imaging
Mentor: Professor Shree Nayar

- Improved the end-to-end Snapcode scanning performance by 7.2 times on iPhone 10 image data through redesigning and implementing a deep learning-based solution
- Thoroughly investigated potential improvements in the physically-based synthetic image data generation algorithm which helps avoid gathering expensive labeled data
- Optimized the performance, runtime, and size of the neural networks by setting up and evaluating large-scale experiments on Google Cloud virtual machines
- Developed an Android app to showcase the enhanced performance and performed live testing

Columbia Computer Graphics Group | Mar.–May, Sep. 2020–Apr. 2021 New York, NY
Research Assistant, Computer Vision and Signal Processing
Advisor: Professor Changxi Zheng

- Performed optical experiments of a laser microphone array and iteratively adjusted the setup
- Wrote a Gaussian-fitted cross-correlation algorithm to reconstruct audio from a silent video of laser speckles
- Investigated potential causes of noises and improved the signal-to-noise ratio

Columbia Digital Video and Multimedia (DVMM) Lab | Feb. 2020–May 2020 New York, NY
Research Assistant, Computer Vision
Advisor: Professor Shih-Fu Chang

- Participated in developing a transformer-based autoregressive neural network model to predict a time series of facial landmarks from audio data (in TensorFlow 2)
- Read and summarized prior works on generative neural networks

Colgate Physics Department | May 2018–May 2019 Hamilton, NY
Research Assistant, Optics
Advisor: Professor Enrique (Kiko) Galvez

- Participated in building the optical setup and testing the optical pendulum states iteratively
- Presented the research poster at the Frontiers in Optics 2019

Colgate Computer Science Department | May 2017–Mar. 2018 Hamilton, NY
Research Assistant, Web Application HCI
Advisor: Professor Madeline Smith

- Designed and developed user-centered features of a web app to improve the video co-watching experience for geographically-separated users
- Presented the research poster at the ACM *GROUP* conference 2018

Work Experience

Google Search | May 2019–Aug. 2019 Mountain View, CA
Software Engineering Intern

- Developed full-stack a high-precision-low-recall recommendation feature on the mobile Search Engine Result Page
- Worked on query expansion, result retrieval/filtering/clustering, and class label extraction
- Delivered versions of the feature and analyzed their live experiment feedback through performing iterative quality improvement, designing flexible/extensible infrastructure, and implementing agile development strategies
- Extracted intuitions on user interaction patterns from large-scale live experiment results and presented them to the team for future feature development
- Worked cross-functionally with product managers, designers, and other teams
- Received a guaranteed return internship offer

Honors and Awards

2021	Magna Cum Laude, Columbia Engineering
2021	Summa Cum Laude, Colgate University
2020	Phi Beta Kappa Academic Honor Society (13/778)
2020	Sigma Pi Sigma Academic Honor Society in Physics
2017	Edwin Foster Kingsbury Prize for Excellence in Physics
2017	Grace Hopper Celebration Research Scholar, Computing Research Association-Women
2016	Bronze Medal (Team Competition), The University Physics Competition

Selected Coursework

Computational Photography	Convex Optimization	Machine Learning
Deep Learning for Computer Vision	Differential Equations	Discrete Mathematics
Artificial Intelligence	Quantum Mechanics	Electricity and Magnetism
Thermodynamics and Statistical Mechanics	Computation and the Brain [project: Perception and Deep Learning]	
Digital Signal Processing	Quantum Computing [project: Quantum Image Classification]	
Electronics [project: car racing game]	Computational Mechanics [project: Simulating 2D Incompressible Flow]	

Skills

Languages	Fluent (>10k l.o.c. on avg.): Python, Java, C++ Familiar (>1k l.o.c. on avg.): C, MATLAB, SQL, HTML, CSS, Protobuf, Bazel, JavaScript
Frameworks	PyTorch, TensorFlow2, Numpy, Opencv, Qiskit, Tensorflow Quantum, Sklearn, Pandas, Seaborn

Teaching and Service

2019–2020	Peer Mentor, Engineering Student Council, Columbia University
2017–2019	Teaching Assistant, Data Structures in Java, Colgate University
2018	Teaching Assistant, Electricity and Magnetism, Colgate University