Yingsi Qin

PhD Candidate in Electrical and Computer Engineering @ Carnegie Mellon University
Computational 3D Displays for VR, AR, and MR
https://yingsiqin.github.io

Education

Ph.D. in Electrical and Computer Engineering | **Carnegie Mellon University** — *Pittsburgh, PA*
Advisor Aswin C. Sankaranarayanan — *Sep 2021 — Present*
Focus Computational 3D Displays for Virtual, Augmented, and Mixed Reality

B.S. in Computer Science | **Columbia University** | GPA: 3.98 — *New York, NY*
Focus Intelligent Systems, Computer Vision — *Sep 2019 — May 2021*

B.A. in Physics | **Colgate University** | GPA: 3.93 — *Hamilton, NY*
Focus Optics, Physics-Based Modelling — *Sep 2016 — May 2019*

Publications

Split-Lohmann Multifocal Displays [paper] [supp] [vid] [talk] [project] [code] [blender] ***Best Paper Award***
Yingsi Qin, Wei-Yu Chen, Matthew P O'Toole, Aswin C Sankaranarayanan
Journal | ACM Transactions on Graphics (SIGGRAPH) 2023

Single-Shot VR [paper] [project] [vid] ***Best Demo Award at ICCP***
Yingsi Qin, Wei-Yu Chen, Matthew P O'Toole, Aswin C Sankaranarayanan
Conference | ACM SIGGRAPH 2023 Emerging Technologies 2023

Pendulum Beams: Optical Modes that Simulate the Quantum Pendulum [paper]
Enrique J Galvez, Fabio J Auccapuclla, **Yingsi Qin**, Kristina L Wittler, Jake M Freedman
Journal | Journal of Optics 2021

Pendulum beams: a window into the quantum pendulum [paper]
Enrique J Galvez, Fabio J Auccapuclla, Kristina L Wittler, **Yingsi Qin**
Conference | Proceedings of Complex Light and Optical Forces XIII 2019

Simulating Quantum Mechanics with Light: The Quantum Pendulum Via Mathieu Beams [paper]
Enrique J Galvez, Fabio J Auccapuclla, **Yingsi Qin**, Kristina L Wittler
Conference | Frontiers in Optics 2019

Industry Internships

Snap Research | Jun 2020 — Dec 2020 — *(Remote) New York, NY*
RESEARCH INTERN | *Supervisor: Professor Shree Nayar*

- Improved the end-to-end Snapcode scanning performance by 7.2 times on iPhone 10 image data by (1) reimplementing a physics-based synthetic data generation algorithm & (2) redesigning a deep neural network
- 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
- Mentored by Guru Krishnan and Jian Wang

Google Search | May 2019 — Aug 2019 — *Mountain View, CA*
SOFTWARE ENGINEERING INTERN | *Manager: Ian Zheng*

- Full-stack developed a high-precision-low-recall recommendation feature on the Google Search Result Page
- Improved the click-through-rate (CTR) by iteratively performing large-scale real-world live user experiments, extracting intuitions on user behavioral patterns, and implementing software changes agilely
- Wrote flexible/scalable/extensible query expansion, result filtering/clustering, and label extraction algorithms
- Worked cross-functionally with product managers, designers, and other teams

University Research

Columbia Computer Graphics Group | Mar 2020 — May 2020 & Sep 2020 — Apr 2021 *New York, NY*
UNDERGRADUATE RESEARCH ASSISTANT | Advisor: Professor Changxi Zheng
Field: Physics-Based Computer Vision
- Built a laser microphone to reconstruct audio from a silent video of moving 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*
UNDERGRADUATE RESEARCH ASSISTANT | Advisor: Professor Shih-Fu Chang
Field: Deep Learning
- Wrote a transformer-based neural network aiming to predict a facial landmark video from audio (Tensorflow 2)

Physics Department at Colgate University | May 2018 — May 2019 *Hamilton, NY*
UNDERGRADUATE RESEARCH ASSISTANT | Professor Enrique (Kiko) Galvez
Field: Optics
- Executed building the optical setup and experimentally captured the optical pendulum states

Computer Science Department at Colgate University | May 2017 — Mar 2018 *Hamilton, NY*
UNDERGRADUATE RESEARCH ASSISTANT | Advisor: Professor Madeline Smith
Field: Web Application HCI
- Designed and developed user-centered features of a web app to improve remote video co-watching experience

Honors and Awards

2024	Tan Endowed Graduate Fellowship, Carnegie Mellon University
2023	Best Paper Award, SIGGRAPH 2023
2023	Best Demo Award, ICCP 2023
2021	Magna Cum Laude, Columbia Engineering
2021	Summa Cum Laude, Colgate University
2020	Phi Beta Kappa (13/778) and 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

Invited Talks

Aug 2023	**Split-Lohmann Multifocal Displays**, *Technical Paper Talk,* SIGGRAPH 2023	*Los Angeles, CA*
Oct 2023	**Split-Lohmann Multifocal Displays**, *Talk in* 中文, TechBeat	*Remote*
Nov 2023	**Split-Lohmann Multifocal Displays**, *Guest Lecture,* NYU	*New York, NY*

Teaching and Service

Jan 2021 — May 2021	**Teaching Assistant**, *Signals and Systems,* Carnegie Mellon University
Aug 2019 — May 2020	**Peer Mentor**, *Engineering Student Council,* Columbia University
Aug 2017 — May 2019	**Teaching Assistant**, *Data Structures in Java,* Colgate University
Aug 2018 — Dec 2018	**Teaching Assistant**, *Electricity and Magnetism,* Colgate University

Selected Coursework

Physics-Based Vision	Deep Learning for Computer Vision	Computational Photography [project]
Computer Vision	Machine Learning	Visual Databases [project]
Convex Optimization	Electricity and Magnetism	Computation and the Brain [project]
Linear Systems	Estimation, Detection, and Learning	Quantum Computing [project]
Differential Equations	Quantum Mechanics	Computational Mechanics [project]
Probability and Statistics	Thermodynamics and Statistical Mechanics	Electronics [project]

Programming Languages

Proficient (>80k avg loc): Python, Java, C++

Familiar (>8k avg loc): MATLAB, C, SQL, JavaScript, HTML, CSS