Luke Qi

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Education

Stanford University Sep. 2021 – Present
PhD. in Applied Physics *Stanford, CA*

Massachusetts Institute of Technology Sep. 2017 – Jun. 2021
S.B. in Physics, S.B. in Electrical Engineering *Cambridge, MA*

- GPA: 5.0/5.0
- Coursework: Photonics, Experimental Physics, Analog Electronics Lab, Machine Learning, Quantum Mechanics I-III, Signal Processing, Electromagnetics and Applications, Statistical Mechanics, Inference

Research and Industry Experience

IonQ Inc. Jun. – Aug. 2021
Summer Intern *College Park, MD*

- Built software to optimize ion trap designs using topology optimization techniques

Photonics and Modern Electro-Magnetics Group Feb. – Jun. 2021
Undergraduate Researcher *Cambridge, MA*

- Studied quantum walker protocols immersed in non-Abelian fields. Found indicators of spin-orbit coupling

Nanostructures and Computation Group Feb. – Jun. 2021
Undergraduate Researcher *Cambridge, MA*

- Built a fast approximate Maxwell solver for electromagnetic scattering through layered photonic devices variable surface-impedance structures. Written in Julia

MIT Quanta Lab Aug. 2019 – Jun. 2021
Keel Foundation Undergraduate Research and Innovation Scholar *Cambridge, MA*

- Launched a collaboration with Gonzalo Muga's theory group to develop robust ion shuttling protocols
- Created an end-to-end numerical simulation pipeline to optimize voltage waveforms for quantum computers
- Built remote laser shutter controllers and characterized the system's high-voltage amplifier

Trace Matters Scientific Feb. – Aug. 2019
Hardware Engineering Intern *Somerville, MA*

- Built a backend data acquisition system used directly in the company's prototype mass spectrometer
- Implemented a quadropole mass filter controller and low-latency communication with front-end server

MIT Aerospace Controls Laboratory Sep. – Dec. 2018
Undergraduate Researcher *Cambridge, MA*

- Implemented human detection algorithms on a system with one Velodyne lidar and six RGB cameras
- Built a full computer vision pipeline to extract human trajectories and collected data throughout Boston

The Aerospace Corporation Jun. – Aug. 2018
Technical Intern II in the Innovation Lab *Los Angeles, CA*

- Developed computer vision algorithms that work in space using Point Cloud Library and AR tags
- Programmed Arduino robots using PID controls and IR communication to demonstrate swarm robotics techniques

Published Work

Qi, Luke, et al. "Fast and robust particle shuttling for quantum science and technology." arXiv:2104.07362 (2021).

Taghioskoui, M., Qi, L. *Low-Pressure ICP-MS for Planetary Trace Elemental Analysis.* Harsh-Environment Mass Spectrometry Workshop, 16-19 September 2019, Myrtle Beach, SC.

Leadership

MIT Ridonkulous Dance Team | *Captain, VP External* Sep. 2018 – Dec. 2020

- Elected captain in charge of creating and executing the team's competition set and leading tri-weekly practices

Technical Skills

Software: Python: (PyTorch, SciPy, NumPy), Julia, MATLAB, SPICE, Xilinx Vivado, ROS, KiCAD, Linux
Hardware: Pynq System-on-a-Chip, Arduino, Oscilloscopes, VNA, PCB design, FPGA programming