

Daniel Zhan

UNDERGRADUATE RESEARCHER, SOFTWARE ENGINEER

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Education

Cornell University

Ithaca, NY

B.S. ENGINEERING PHYSICS AND COMPUTER SCIENCE: GPA: 3.5/4.0

Expected May 2023

Coursework:

PHYSICS: (Junior year) Mechanics, (Junior+Senior year) Electromagnetism, (Junior+Senior year) Quantum Mechanics, Controlled Fusion, Electronic Circuits, Statistical Mechanics, Plasma Physics (audited), [TA for: (Freshman year) Mechanics, E&M, Waves]

COMPUTER SCIENCE: ML, Algo, Robotics, Functional Programming, OS, Computer Systems, Object Oriented Programming, Market Networks

MATH: (Sophomore+Junior year) Mathematical Physics, Differential Equations, Multivariable Calculus, Linear Algebra, Discrete Structures

Experience

Fuchs Group

Ithaca, NY

UNDERGRAD RESEARCH ASSISTANT

Sept. 2021 - Present

- Developed a computational quantum dynamics model of the Nitrogen-Vacancy charge center in the diamond carbon lattice. This model details the spin state transitions of the system, some of which are strongly photoluminescent. The model will be verified against literature and then altered to model a similar Boron-Vacancy center. The latter system may be of interest in quantum sensing applications due to visible transitions.
- The model is being developed in Python using the QuTiP package, which allows Lindbladian computations to be performed on an open system.

Honeywell

Broomfield, CO

PHYSICS LAB TECHNICIAN INTERN

Jun. 2021 - Aug. 2021

- Developed a custom designed Surface Ion Trap Chip tester to automate scalable testing of Honeywell Quantum's surface electrode traps.
- Implemented a fast and live hardware calibration, capacitance and resistance tests, histogram plotter, flexible test settings, and an intuitive GUI to measure the electrical characteristics of ion traps at the device level by interfacing Python with NI computer and DMM hardware.
- This program reduces the time required to test ion traps by over 90% and eliminates sources of human error, and scales linearly with trap size.
- Shadowed lab scientists as they prepared various hardware tests and prepared vacuum chambers to conduct supercooling on ion trap chips.

Cornell Mars Rover

Ithaca, NY

SOFTWARE ENGINEER

Sept. 2020 - Present

- Worked with a team of 70 engineers to build a rover from scratch to analyze soil, navigate autonomously, and complete various other tasks.
- Planned out an implementation of Inverse Kinematics for the Rover's arm to enable intelligent, automated endpoint movement without requiring specification for individual motor writes and angles, thereby improving Rover competition prospects by simplifying user controls.
- Defined macro movement sequences in C++ for the arm to collect and deposit soil to be analyzed at an optimal approach and orientation.

Merck

Kenilworth, NJ

AUTOMATION DEVELOPER INTERN

Jun. 2020 - Apr. 2021

- Implemented various automation processes to time-consuming business tasks in the Merck Research Lab Space to enable 2000% speed-ups.
- Developed web-scraping tools using Python, Selenium, and Pandas to automate the collection and processing of competitor drug information.

Projects

Exoplanet Data Visualizer

PYTHON, FLASK, ASTROPY

Jun. 2020 - Aug. 2020

- Built upon a Flask web application that displays transmission spectra of a theoretical exoplanet with adjustable characterization parameters.
- Developed backend functionality to interpret planet characterization parameters using Python, AstroPy and big datasets from ten known exoplanets to display a scalable forward model grid of exoplanet transmission spectra.

Foodie - Submission for Everest Hacks 2020

PYTHON, TKINTER

Sept. 2020

- Developed a desktop application that suggests recipes to create and ingredients to purchase for said recipes with the TkInter GUI library.
- Placed top 10 overall at Everest Hacks 2020 out of a total of 50 competitor teams.

Skills/Activities

Skills/Technologies

Python, Flask, Git, Java, C++, OCaml, HTML/CSS, Javascript, Circuit Design, Arduino Microcontrollers, Lab Proficiency

Activities

Team Captain @ Cornell Badminton, Badminton PE Instructor, VP/Mentor @ CU AEP Society, Mentor @ ACSU, ΛΦΕ

Interests

Badminton (I'm pretty good), Karate, Electric Bass, Chess (I'm terrible), Civilization V, Video Game Design