

# Daniel Zhan

UNDERGRADUATE RESEARCHER, SOFTWARE ENGINEER

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## Education

### Cornell University

Ithaca, NY

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

Expected May 2023

#### Coursework:

PHYSICS: Mechanics (*Honors*) (TA), Electromagnetism I (TA), Waves (TA), Quantum Mechanics I, Electromagnetism II, Astronomy & Cosmology

COMPUTER SCIENCE: Machine Learning, Algorithms, Functional Programming, Operating Systems, Computer System Organization, Object Oriented Programming and Data Structures, Market Networks

MATH: Mathematical Physics I, Differential Equations, Multivariable Calculus, Linear Algebra, Discrete Structures (*Honors*)

FALL 2021 COURSEWORK: Classical Mechanics, Climate Dynamics, The Earth System, Earthquakes

## Experience

### Fuchs Group

Ithaca, NY

UNDERGRAD RESEARCH ASSISTANT

Sept. 2021 - Present

- I am currently developing a model to predict the quantum properties of Nitrogen-Vacancy centers in the diamond carbon lattice. This model will be used to predict properties of a similar Boron-Vacancy center, of which we know little about.

### 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

- Optimized the Rover's Hardware Abstraction Layer to enable lag-less responsiveness to 150 remotely transmitted instructions per minute by implementing bundled message formatting and processing. Additionally, upgraded the Rover's messaging format to ASCII for better legibility.
- Currently planning out an implementation of Inverse Kinematics for the Rover's arm to enable intelligent endpoint movement without requiring specification for individual motor writes, thereby improving Rover competition prospects by simplifying user controls.

### 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

### Languages/Frameworks

Python, Flask, Git, Java, C++, C, OCaml, HTML/CSS, LaTeX

### Activities

Team Captain @ CU 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, Cooking (but more so eating)