

Daniel Zhan

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Education

Johns Hopkins University - M.S.E. Robotics: expected Dec. 2025

Cornell University - B.S. Computer Science, Engineering Physics: graduated May 2023

Notable Coursework: Machine Learning, Robot Learning, Algorithms, Operating Systems, Computer System Organization, Analytical Mechanics, Electrodynamics, Electronic Circuits, Mathematical Methods for Physicists, Experimental Laboratory

Served as a Teaching Assistant for: Mechanics and Heat, Electromagnetism, Waves and Quantum Physics, Data Analytics

Experience

Research Assistant - Terradynamics Lab, Johns Hopkins University | Nov. 2023 - Present

- Simulated robot traversals through various obstacles to discover energy-efficient locomotion strategies in C++.

Software Engineer - Lockheed Martin | Aug. 2023 - Present

- Implemented server-side functionality to enable usage of a default radar search algorithm in Java and SQL.
- Executed build verification and regression tests for new backend features to identify and correct critical issues.

Software Engineer - Cornell Mars Rover, Cornell University | Sept. 2020 - June 2023

- Upgraded the C++ robotic arm control software package from ROS 1 to ROS 2, reimplementing all core functionality.
- Implemented a Forward Kinematics control scheme for manipulation of joint angles, enabling precise arm control.
- Designed and implemented an Inverse Kinematics control scheme for the robotic arm, achieving a >90% reduction in arm task completion time by enabling direct end-effector position and orientation manipulation.

Research Assistant - Cornell University | Sept. 2021 - May 2023

- Developed a computational quantum dynamics model of the Nitrogen-Vacancy center in diamond in Python using the QuTiP package. Discovered a ~20% reduction in transition photoluminescence upon driving the defect at resonance.
- Developed upon a 2D two-fluid MHD simulation of an ablating plasma in Fortran 90. Experimented with various magnetic fields and material configurations to produce coherent plasma jets for use in nuclear fusion applications.

Physics Laboratory Technician Intern - Honeywell | June 2021 - Aug. 2021

- Developed an automated tester for Honeywell's ion trap chip, ensuring its electrical properties met all specifications.
- Reduced ion trap chip testing time by 95% through a Python-based test suite with live calibration, capacitance and resistance tests, custom settings, and a modern GUI, eliminating human error and simplifying testing procedures.

Projects

- **Aphelion Defense:** I led a team of 10 to develop a mobile video game developed in C++, featuring networked multiplayer. As team lead, I proactively fostered a productive and focused team environment, facilitated communication between different sub-teams, and mediated team conflicts and disputes. As a programmer, I implemented unit pathfinding algorithms as well as modular graphics and UI systems. This game is available in beta.
- **County Political Leaning Predictor:** I developed a machine learning model using PyTorch to predict the political leaning of every U.S. county using demographics data. It achieved >80% accuracy against 2016 election results.
- **Flappy Bird AI:** I developed a reinforcement learning model to train on Flappy Bird using Python and PyGame. After learning for several hours, the AI achieved a score of over 10,000, an impossible score to achieve for humans.

Skills and Miscellaneous

Skills: Research, Robotics (ROS, MoveIt), Software Development, Computational Modelling, Circuit Design and Analysis, Machine Learning (Pytorch), Programming Languages (Python, C++, Java), Databases (SQL), Version Control (Git), Linux, Unix

Interests: Competitive Badminton, Amateur Weightlifting, Chess (sometimes), Video Games (Counter Strike 2, Civilization V)