

Alexander Suen

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EDUCATION

Stanford University Stanford, CA | B.S in Electrical Engineering *Expected June 2027*
2024-2025 Coursework: Signals and System I, Signals and System II, Circuits I, Circuits II, Ordinary Differential Equations, Vector Calculus, Programming Abstractions in C++, Computer Vision: Foundations and Applications

Dublin High School Dublin, CA *June 2024*
Unweighted GPA: 4.00/4.00, Weighted GPA: 4.56/5.00

EXPERIENCE

Stanford University Arbabian Lab Stanford, CA *Fall 2024*

- Designing 2nd generation **PCB** boards for sonar detection in ocean mapping using photoacoustic effect
- Using **Altium** for PCB layout and focusing on reusability and iterability for future generations
- Routed more than 400 traces across 4 layers and included polygon pours for GND & PWR for protection
- **Testing** and **verifying** correct functionality of boards post fabrication with **development kits**

NASA Ames Research Internship Mountain View, CA *Summer 2023*

- **Researched** use of biodegradable drones paired with AI to fight wildfires
- Created **novel design** that utilizes aqueous lithium-ion batteries and a mycelium structure
- **Coordinated** with two NASA engineers and implemented changes based on feedback from weekly meetings
- Published **paper** on NASA's website and **presented** design to director of NASA Ames Research Center

ASDRP Research Program Fremont, CA *Summer 2021 - Winter 2023*

- Researched use of **nano-silicon** (20nm - 50µm sizes) in lithium-ion anode batteries
- Used **cyclic-voltammetry** and **galvanostatic charge-discharge** to measure specific capacity
- Trained **machine learning model** to identify key factors in determining home loan approval
- Cleaned and supplied model with **10 years of home loan data** from various target cities in the USA
- Displayed **decision tree model** for visual representation of model's behavior and to detect if race was a factor

PROJECTS

Custom Verilog CPU Design *Fall 2024*

- Implemented a **32-bit CPU** in **Verilog** with program and data memory, arithmetic instructions, and logical unit
- Incorporated **jump** and **branch** instructions and **register** files for proper functionality
- Created **verification test benches** to validate CPU design through **Xilinx Vivado** software

Self-Leveling PCB System *Spring 2024*

- Designed and simulated circuit in **NI Multisim** SPICE-based circuit simulation software
- Created physical prototype on breadboard and used **Fusion 360 Electronics** for designing layout of PCB
- **Masked, etched, drilled, and soldered** components onto a single-layered copper board
- PCB detects levelness of system and illuminates LEDs in correction direction

4-Function FPGA Calculator *Summer 2023*

- Coded mathematical operations in **Verilog** and implemented **I²C** data transfer protocols
- Controlled 2-line LCD display with **I²C** and created scanning **IP blocks** for keypad membrane in Verilog
- Created testbenches and debugged issues through waveforms with Verdi verification software
- Ported design onto **Xilinx FPGA** through **Vivado** and was able to perform basic mathematical operations

AI Allergy Detection Software Application *Spring 2023*

- Developed software that automatically detects if groceries contain allergens specific to the shopper
- Used **Google Cloud Vision AI** and **Python** to automatically detect shopper's face and groceries
- Implemented database in **SQLite3** and coded .sql files for storing shopper's allergens and account information
- Used **Flask, Gunicorn, NGINX**, to set up server to run website where users can create accounts and input allergens

TECHNICAL SKILLS & AWARDS

Technical Skills: Python, Java, C++, Verilog, MATLAB, Xilinx Vivado, Altium, Arduino, NI Multisim, Breadboarding, PCB Design & Fabrication, Fusion 360 Electronics, OpenCV, Flask, Gunicorn, NGINX, Xcode, Oscilloscopes

Honors & Awards: USA Physics Olympiad Qualifier, American Invitational Mathematics Examination Qualifier, IEEE MIT URTC Presenter, Lead Presenter at 2022 Material Research Society International Conference, Presenter at 68th American Vacuum Society International Conference, 2 Journal Publications in IJRASET