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## PROFILE

Portfolio: [www.mihir.space](http://www.mihir.space)  
Capstone Project: [ionicskies.com](http://ionicskies.com)

UC Santa Barbara 2021  
B.S. Electrical Engineering  
3.66

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## COURSEWORK

Analog Circuit Design  
Computer Vision  
Digital Design  
Digital Signal Processing  
Electromagnetism  
Haptics  
Linear Systems (Graduate)  
Nonlinear Dynamics  
Probability & Statistics  
Semiconductor Devices

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## HARDWARE

PCB Design  
Power Electronics  
AVR & STM microcontrollers  
Linear Amplifiers  
Battery Design  
Arduino, Raspberry Pi  
3D Printing, Machining  
Composites

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## SOFTWARE

Python(numpy, keras, opencv,  
pytest, logging, multithreading)  
Embedded C  
Matlab  
Jupyter Notebook  
Git, Makefiles, Bash  
Kicad + Eagle  
Solidworks + Inventor  
LaTEX

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## WORK EXPERIENCE

### Tesla

Thermal Integration Intern  
06/2020 - 09/2020

- Built up software infrastructure for automated testing of Tesla Semi thermal systems using thermal buck - preventing 1yr delay of release
- Designed automated thermal buck self test with component level and system level parts to verify that all systems are operational before more complex tests
- Used Jenkins, CAN+UDS protocols, SCPI, interlock circuits, high power cabling, and various python libraries - pyserial, logging, pytest, threading, internal libs

### CTRL-Labs (now Facebook Reality Labs)

Hardware Engineering Intern  
06/2019 - 09/2019

- Worked on analog front-end(AFE) of electromyography armband that decodes physical muscle movement from signals travelling through neurons in the arm
- Proposed and executed AFE biasing voltage changes that save space, power, and complexity, extensively verified and analyzed results in Jupyter Notebook
- Performed oversampling experiments to verify SNR improvements, uncovered and diagnosed SPI timing issues that were exacerbated at higher sampling rates

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## LEADERSHIP EXPERIENCE

### Ionic Skies - [ionicskies.com](http://ionicskies.com)

Capstone Project Lead  
03/2020-Present

- Started 14 person interdisciplinary senior capstone team to build first ever fully controllable ionic wind aircraft
- Resulted in properly mass balanced aircraft with ionic thrusters that generated 120g of thrust (60%) at 34kV, powered by DC-DC power converter
- Led design and development of ionic thrusters and DC-DC power converter, and managed integration with airframe and launcher
- Deeply involved in DC-DC power converter development - 3 stage inverter, transformer, multiplier circuit that successfully converts 180Vin to 40kVout, 550W, and 78% efficiency

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## PERSONAL PROJECTS

### Ball Balancing Robot (BB-9)

- Robot that balances on spherical wheel
- Acc+gyro sensor fusion thru complimentary filter, and PID controller achieves robust balance
- Concepts included PCB design, Kalman filtering, Lagrangian mechanics, and wrote I2C driver

### And More

- Bamboo bike
- Weight sensing electric longboard
- 3-axis CNC router
- Personal website [www.mihir.space](http://www.mihir.space) features pictures and videos of all my projects!