**SUMMARY**

Aerospace Engineer with R&D experience. Looking for a role with a math and physics focus. Versed in missile design, GNC, radar, stereo vision, airfoil analysis, spacecraft electric propulsion, hardware testing, and systems engineering. Willing travel and relocate.

**EXPERIENCE**

**Hardware Test Engineer,** *Project Kuiper, Amazon* **2021-present**

* Owned environmental testing of the electric thruster power and control board. This involved designing, building, and running test racks which would touch flight hardware. The test racks included typical electronics testing equipment (power supplies, SMUs, electronic loads), a custom interface PCBA, and custom harnessing.
* Wrote automation code for the test racks. This included python software development of test equipment drivers and a framework for testing. Data from both the unit under test and the test equipment was collected and analyzed against performance requirements. Data and results were saved locally as well as streamed to AWS for real-time monitoring.

**GNC Engineer,** *Sandia National Laboratories* **2020-2021**

* Augmented a hypersonic missile simulator with different guidance laws. I examined novel guidance laws from research papers and implemented the algorithms in a missile simulator. The simulator evaluated performance of different GNC methods using Monte Carlo analysis.
* Developed a digital twin for a hypersonic missile. I modeled sub-components in Simulink then ran them on combination HWIL/SWIL test racks. The digital twin was modularized so that physical avionics components could be mixed with simulation hardware for rapid development and testing.
* Tested fin and actuator sub-assemblies. I wrote the test plan, ran the tests, and analyzed the results. This testing involved large stores of mechanical and electrical energy therefore I developed safety procedures for the equipment.

**Aerospace Engineer,** *General Atomics* **2018-2020**

* Created a 3D tracking system using stereo vision. The system was designed for tracking railgun projectiles during flight and shrapnel during dispense. I learned about image analysis, high speed cameras, IR cameras, and lensing.
* Analyzed radar performance against GPS data from UAVs. I flew UAVs equipped with RTK GPS receivers downrange of various radar systems. I compared the radar data to the UAV truth data to evaluate accuracy.
* Scanned the railgun bore to check for wear and depositions. A laser sheet scanner captured pictures inside the bore. I created a program to turn these pictures into a 3D representation. This program could also compare different scans to see how the shape changed over time.
* Automated imperfection identification for electric motor builds. Photos were taken of electric motors during production. I automated stitching together the photos and classifying the imperfections. If the quantity or size of imperfections was too large, then the motor would need to be re-worked.
* Created a liquid-cooled thermal management system simulation for a high-powered laser system. It was used to simulate different pipe layouts, working fluids, and heat exchangers. It could optimize the pipe layout in
  + Radiator/heat exchanger analysis
  + Pipe flow analysis
* Formulated multiple roll control methods for the next-gen interceptor. These control methods included PTOC, SMC, and PID.
* Evaluated multiple hydrofoil designs for submarine concept.

**Researcher and TA,** *University of Illinois* **2015-2018**

* TA for the electric propulsion class covering plasma physics and thruster architecture.
* Research assistant in the electric propulsion lab. Worked on:
  + Fusor, Helicon, RF power, vacuum chamber, laser interferometry, plasma
  + [arc.aiaa.org/doi/abs/10.2514/6.2017-4629](https://arc.aiaa.org/doi/abs/10.2514/6.2017-4629)
* Research assistant in the fusion lab. Worked on:
  + Tokamak, plasma deposition, circuits, plasma, vacuum, slow motion imaging
  + [nucleus.iaea.org/sites/fusionportal/Shared%20Documents/FEC%202016/fec2016-preprints/preprint0582.pdf](https://nucleus.iaea.org/sites/fusionportal/Shared%20Documents/FEC%202016/fec2016-preprints/preprint0582.pdf)

**Structural Engineer and Team Lead,** Manned Mars Mission, *University of Illinois* **2016-2017**

* Systems engineering, spacecraft structures, AIAA design competition, trade studies

**Engineer and Business Associate,** *Empod* **2013-2017**

* CAD, IMDS, 3D printing, Manufacturing, Windchill

**Design Engineering Intern,** *Autosplice* **2014**

* Metallurgy, CAD, electrical testing, cross sectioning, heat testing, IQMS

**EDUCATION**

**University of Illinois at Urbana-Champaign** **GPA: 4.00** **2018**

Master of Science, Aerospace Engineering

Electric propulsion, combustion, distributed and satellite control systems

**University of Illinois at Urbana-Champaign** **GPA: 3.97** **2017**

Bachelor of Science, Aerospace Engineering

Control systems, CFD, systems engineering, UAVs, thermodynamics

**SKILLS & LANGUAGES**

* **Software:** SolidWorks, Fluent, NX, Mathematica, Comsol, Abaqus
* **Programming:** Matlab, Simulink, Python, C++, Fortran, Java, SQL
* **Other:** Linux, Windows, Git, SVN, Photoshop, Premier Pro

**ACTIVITIES**

* **Boy Scouts (**Eagle**), Baja SAE**, Raspberry Pi, TechNews,Motorcycles, Bicycles, Camping, Fishing