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Joe Shields

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Joedang.github.io

EDUCATION

- Portland State University, 3.65 GPA **Sep. 2013 – Jun. 2016**
B.S. Mechanical Engineering, Maseeh College of Engineering and Computer Science
Focus: heat and mass transfer
B.S. Physics, College of Liberal Arts and Sciences
Focus: classical mechanics and electromagnetism
- Portland Community College, 3.0 GPA **Sep. 2008 – Jun. 2010, Sep. 2011 – Sep. 2013**

EMPLOYMENT

- Engineer, SpaceX **Mar. 2019 – Sep. 2019**
Supported a wide variety of mechanisms on the [human-rated Dragon 2 docking systems](#)
Wrote detailed and intuitive assembly instructions to meet strict quality standards
Owned aggressive build schedules and held others accountable to them
Solved issues including design errors, part damage, missing parts, and documentation errors
- R&D Engineer, [Pacific Diabetes Technologies](#) **Sep. 2018 – Feb. 2019**
Prototyped wearable micro-fluidic devices and electronic enclosures
Created designs, models, and drawings for patent applications
Designed miniaturized assemblies for 3D printing and injection molding

VOLUNTEERING

- Mechanical Lead, PSAS **Dec. 2015 – Mar. 2019, Sep. 2019 – present**
[Created an open-hardware carbon fiber rocket airframe](#) for the [Portland State Aerospace Society](#)
Managed interdisciplinary projects among students and professionals
Published and presented [a conference paper on the project for AIAA SPACE 2016](#)
Documented design and manufacturing processes to foster institutional knowledge
Mentored student projects and assembled project teams
Maintained equipment and lab space
Designed parts using hand calculations, prototypes, computer models, CFD, and CAD
Performed FMEA and root-cause analysis
- Design Engineer, OreSat **Jan. 2017 – Mar. 2019**
Coordinated the design of all mechanical subsystems in [Oregon's first satellite](#)
Maintained the [top-level SolidWorks assembly](#) of the satellite
Incorporated constraints from NASA, NanoRacks, and OreSat electrical subsystems
Worked across engineering disciplines to resolve highly coupled designs
Led analysis and design reviews
- Lab Manager, [PSU Electronics Prototyping Lab](#) **Jan. 2018 – Mar. 2019, Sep. 2019 – present**
Maintained equipment and lab space
Trained students on prototyping equipment
Ran the lab's parts store

TOOLS

- Composites manufacturing (wet, dry, high/low-temperature), metal working
- 3D printers (FDM, SLA, SLS, MJP), laser cutters, mills, lathes, hand tools
- PCB routers, soldering (hand, re-flow), oscilloscopes, various microscopes

SOFTWARE

- R, MATLAB, C++, Python, Bash, Vim, Git, Jekyll, HTML
- SolidWorks, NX, Teamcenter, Onshape, Abaqus, AutoCAD, GIMP, Inkscape
- L^AT_EX, Microsoft Office, Libre Office, Google Docs, et cetera
- Linux, Windows

SMALL PROJECTS

In addition to the projects below, you can check out the rest of my portfolio at github.com/Joedang.

- iTopie printer
Modified and built a RepRap-based 3D printer from individually sourced parts including a laser-cut frame
- [Restricted 3-body simulation](#)
An R script for investigating the motion of satellites within planet-moon systems
- [Ballistic trajectory simulation](#)
Realistic scenarios of short-range ballistic motion of various projectiles on different planets, accounting for buoyancy, drag, centrifugal, and Coriolis effects written in R
- [N-body simulation](#)
Various scenarios involving an arbitrary number of charged massive particles written in MATLAB
- OpenFOAM analysis
A simulation of supersonic flow around the nosecone of a rocket, used to inform its design and estimate aerodynamic heating
- [PSAS Asset Tracking System](#)
Created a specification and front-end in R Shiny for a website to track part maintenance and ownership
- Wearable device enclosure
Created a 3D printed enclosure for a wearable sensor prototype for [APDM](#) using SolidWorks

REFERENCES

- Supervisors
Andrew Greenberg – PSAS director adg4@pdx.edu
Eric Russo – senior engineer 714-395-8453, eric.russo@spacex.com
Chris Clark – EPL director cjclark@pdx.edu
Erik Sánchez, PhD – professor esanchez@pdx.edu
Erin Schmidt – former PSAS mechanical lead esch2@pdx.edu
- Peers
Douglas Schmidt daschmid@alumni.cmu.edu
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