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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, Abaqus, AutoCAD, GIMP, Inkscape
- LaTeX, 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.

- 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.
- 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.
- 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
  - Calvin Young — youngcal@pdx.edu
  - Adam Harris — alegendaryhamster@gmail.com
  - Marie House — hmarie@pdx.edu

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