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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: mechanics and electromagnetism

- Portland Community College, 3.0 GPA **Sep. 2008 – Jun. 2010, Sep. 2011 – Sep. 2013**

Experience

- Mechanical Lead, PSAS **Dec. 2015 – 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
- Mechanical Lead, OreSat **Jan. 2017 – present**
  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 – 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), laser cutters, mills, lathes, hand tools
- PCB routers, soldering (hand, re-flow), oscilloscopes, various microscopes

Software

- R, MATLAB, C++, Python, Bash, Vim, Git, SolidWorks, Abaqus, AutoCAD, GIMP, Inkscape
- LaTeX, Microsoft Office, Libre Office, Google Docs, etc.
- Ubuntu, 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 PSAS' new 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
  - Erik Sánchez, PhD – professor — esanchez@pdx.edu
  - Erin Schmidt – former PSAS mechanical lead — esch2@pdx.edu
  - Chris Clark – EPL director — cjclark@pdx.edu
- Peers
  - Calvin Young — youngcal@pdx.edu
  - Adam Harris — alegendaryhamster@gmail.com
  - Marie House — hmarie@pdx.edu

rendered July 30, 2018