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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

- Design Engineer, Earth and Space Institute and AirPhoton **Oct. 2021 – Present**
Designing orbital, airborne, and ground-based instruments
Managing system requirements and interfaces
Working with contractors, customers, scientists, and engineers to create system specifications
Performing space-claim, keep-out-zone, and tolerance analyses
Solving multi-disciplinary design constraints (mechanical, optical, pneumatic, thermal, etc.)
- 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 – Oct. 2021**
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, [Electronics Prototyping Lab](#) **Jan. 2018 – Mar. 2019, Sep. 2019 – Oct. 2021**
Maintained equipment and lab space
Trained students on prototyping equipment
Ran the lab's parts store

TOOLS

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

SOFTWARE

- R, MATLAB, C++, Python, Bash, Vim, Git, Jekyll, HTML
- Inventor, 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 3D printer from parts including a custom laser-cut frame
- [Restricted 3-body simulation](#)
An R script for investigating the motion of satellites within planet-moon systems
- [N-body simulation](#)
Various scenarios involving an arbitrary number of charged massive particles written in MATLAB
- OpenFOAM analysis
A model of supersonic flow around a rocket nosecone, used to inform the part's design

REFERENCES

- Supervisors

Andrew Greenberg – PSAS director

adg4@pdx.edu

J. Vanderlei Martins – principal investigator

301-828-7471, martins@umbc.edu

Eric Russo – senior engineer

714-395-8453, eric.russo@spacex.com

Chris Clark – EPL director

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Erik Sánchez, PhD – professor

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Erin Schmidt – former PSAS mechanical lead

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