Jeremy Welsh

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Technical Skills

- **Programming Languages**: Python, Fortran, C++, C, R, SQL, MATLAB, Julia, Shell scripting (Unix/macOS), Mathematica
- **Frameworks**: NumPy, Pandas, SciPy, Scikit-Learn, TensorFlow, OpenCV, PyMC, MDTraj, Matplotlib, Numba, Flask, ggplot2
- **Software & Tools**: Git, Docker, General Particle Tracer (GPT), GROMACS, LAMMPS, PyMol, ImageJ

Work Experience

- **Senior Intern** Jun 2022 – Jun 2023
  Thermo Fisher Scientific Remote
  - ◇ Wrote Python scripts to automate milling and imaging procedures on dual-beam FIB-SEM systems.
  - ◇ Used Python computer vision libraries such as OpenCV and Skimage for image analysis on FIB images to measure machining tolerances.
  - ◇ Contributed to a software tool (Python) for performing General Particle Tracer (GPT) simulations and data processing/analysis in a Linux HPC environment.
  - ◇ Developed metrics to characterize performance for novel FIB column designs.
  - ◇ Developed Python code to optimize novel FIB column designs, resulting in up to 350% improvement in FIB performance for some applications.
  - ◇ Used Python libraries such as NumPy, SciPy, Pandas, Matplotlib, and Seaborn for data analysis, visualization, and presentation to a team of scientists in order to inform decisions on technology development.

- **Graduate Research Assistant** Sep 2020 – Jun 2022
  University of Oregon Eugene, OR
  - ◇ Performed and analyzed molecular dynamics simulations using GROMACS and LAMMPS molecular dynamics software on HPC clusters at San Diego Supercomputer Center.
  - ◇ Characterized performance and the degree of parallelism of molecular dynamics simulations to determine computational resources requirement on 128 Core/node HPC system.
  - ◇ Developed programs in Python and Fortran for data analysis of ∼10TB of molecular dynamics simulation data.
  - ◇ Validated coarse-grained molecular models against predictions of statistical models such as principal component analysis (PCA) and time-lagged independent component analysis (t-ICA).
  - ◇ Mentored undergraduate and graduate research assistants on projects related to molecular coarse-graining schemes and simulation data analysis

- **Graduate Teaching Assistant** Mar 2022 - Jun 2022
  University of Oregon Eugene, OR
  - ◇ Instructed and graded coursework for tutorials and labs in undergraduate physics courses covering electricity and magnetism, circuitry, and Newtonian mechanics.

- **Library Student Assistant** Sep 2017 - Jun 2022
  University of Oregon Eugene, OR
  - ◇ Trained library student employees on techniques for tutoring elementary and advanced mathematical topics and concepts.
  - ◇ Assisted library patrons with use of library services and systems.

Relevant Coursework

- Modern Optics Lab: Performed optics experiments using lasers, mirrors, oscilloscopes, function generators, RF generators, and piezoelectric crystal diffraction grating.
- Analog and Digital Electronics: *Analog and Digital Electronics*, Daniel A. Steck.
- Quantum Mechanics: *Introduction to Quantum Mechanics*, David J. Griffiths. *Quantum Mechanics*, Daniel A. Steck.

Education

- **M.S., Physics, GPA: 3.92** Sep 2020 - Jun 2022
  University of Oregon Eugene, OR
- **B.S., Mathematics and Physics, GPA: 3.83** Sep 2016 - June 2020
  University of Oregon Eugene, OR