Jeremy Welsh

Email : jeremy@micromelody.net

Mobile : +1 (503) 890-1543

Linkedin: www.linkedin.com/in/jeremy-welsh

Github: github.com/jeremyiwk

TECHNICAL SKILLS

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

WORK EXPERIENCE

Senior Intern - Modeling and Simulation Research Scientist　　Jun 2022 – Jun 2023

Thermo Fisher Scientific　　Remote

- ◇ Wrote Python scripts to automate milling, imaging, and data collection procedures on dual-beam FIB-SEM (focused ion beam - scanning electron microscope) systems.
- ◇ Used Python computer vision libraries such as OpenCV and Skimage for image analysis on FIB-SEM images to measure machining tolerances, optical aberrations, and beam sharpness.
- ◇ Contributed to a software tool (Python) for performing parallel General Particle Tracer (GPT) simulations Linux HPC environment, and for data preprocessing and analysis.
- ◇ Developed statistical 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 - Computational Biophysics　　Sep 2020 – Jun 2022

University of Oregon　　Eugene, OR

- ◇ Developed and validated coarse-grained models for biological macromolecules using molecular dynamics simulations, Monte-Carlo simulations, and stochastic differential equations.
- ◇ Performed and analyzed molecular dynamics simulations using GROMACS and LAMMPS 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.
- ◇ Wrote code in Python and Fortran for statistical analysis of ∼10TB of 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 undergraduate physics courses covering electricity and magnetism, circuitry, and Newtonian mechanics.

Library Student Assistant　　Sep 2017 - Jun 2022

University of Oregon　　Eugene, OR

- ◇ Provided group tutoring and private tutoring for library patrons in math and science subjects including: elementary algebra, probability, statistics, discrete math, calculus, differential equations, linear algebra, partial differential equations, chemistry, and physics.
- ◇ Trained library student employees on techniques for tutoring elementary and advanced mathematical topics and concepts.

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