Penny M. Rowe, Ph.D.

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Programming / Technical Tools
Languages: Python, C, Java, R, MATLAB
Python tools: Pandas, NumPy, SciPy, Matplotlib, Plotly
Frontend: React, Svelte, SvelteKit, Tailwind, TypeScript, HTML, CSS, JavaScript
Backend: Django, FastAPI
Databases: PostgreSQL, SQLite, SQL
Data and Cloud: AWS (S3, ECS), Vercel, Node.js
DevOps: Git, GitHub, GitLab, CI/CD, Docker

Professional Experience

Software Engineer Contractor: 2nd Chair LLC 07/2024 - present
- Assisted in CI website development and REST API using Sveltekit on Vercel, Typescript, Tailwind, AWS ECS & S3.
- Improved website for search engine optimization using Lighthouse in Chrome.
- Coordinated effort to achieve SOC2 attestation.
- Researched and contributed to the implementation of a large language model (LLM) solution, including developing a pipeline for PDF parsing in Python.

Software Engineer Intern: 2nd Chair LLC 11/2023 – 02/2024
- Developed website front end using Sveltekit on Vercel, Typescript, and Tailwind.
- Researched requirements for SOC2 attestation.
- Ideated key performance indicators and researched and implemented off-the-shelf analytics solution.

Research Scientist: NorthWest Research Associates, Inc 2016 – present
- Created and maintained Cambio, a user-friendly, interactive platform for exploring emissions scenarios and visualizing metrics such as atmospheric CO_2. Implemented using Python, Poetry, Django, and SQLite. Hosted on fly.io using gunicorn and WhiteNoise. Version control managed with Git on GitHub. Used in multiple university courses.
- Created and maintained PENGUIN for High School, a website that hosts computational educational modules that improve polar literacy. Created using Javascript, CSS, and HTML. Hosted on GitLab.
- Co-developed 10 computational modules that teach multidisciplinary topics using Excel, Python Jupyter Notebook, and R. Several ranked exemplary; taught to ~80 students per year.
- Analyzed measured and model data using Python, NumPy, SciPy, and NetCDF to investigate role of clouds and radiation during extreme events in Antarctica. See, e.g. here and here.
- Interpolate and compiled temperature-dependent refractive indices of water (Python, NumPy).
- Developed algorithms and geoscience data pipelines for retrievals using techniques including principal component analysis, constrained linear inversion, and optimal estimation in a Bayesian framework. The optimal-estimation-based CLoud and Atmospheric Radiation Retrieval Algorithm (CLARRA) has been applied to datasets from six field experiments and is in ongoing use.

Additional Projects

Plant Share web app. Created for sharing native plants of the Pacific Northwest 2023
- Allows users to request or share plants after registering and signing in.
- Created using Poetry, FastAPI, SQLite, Python, React and CSS. Versioning with Git on GitHub.

Sudoku Solver. Created as a project for courses in Artificial Intelligence and Software Engineering. 2022
- Demonstrates constraint satisfaction using backtracking, AC-3, and heuristics
- Created in Python; converted to Svelte, Tailwind and TypeScript.

My web page. Created to share software engineering and data science projects. 2020 - present
- Created using Sveltekit, Tailwind and TypeScript. Hosted on GitHub pages.

Education

Relevant Coursework (non-matriculated student, University of Puget Sound):
- Algorithms, Data Structures, Software Engineering, Databases, Operating systems, AI, NLP

Ph.D., Physical Chemistry, University of Washington
B.S., Chemistry, with Honors. Minor in Mathematics, University of Puget Sound