# Penny M. Rowe, Ph.D.

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**Programming / Technical Tools**
Python, Pandas, NumPy, SciPy, Django, FastAPI
C, Fortran, Java, R, MATLAB, HTML, CSS, JavaScript, React, Svelte, Sveltekit, Tailwind, TypeScript
SQL, SQLite, mySQL, NetCDF, DynamoDB, AWS (S3, ECS)
Git, GitHub
Agile, Sprints
Linux, macOS, Windows

**Education**
**Non-Matriculated Computer Science Student**, University of Puget Sound, 2021 – 2023
- **Completed Coursework:** Algorithms and Data Structures, Software Engineering, Databases, Operating systems, Artificial Intelligence, Natural Language Processing

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

**Professional Experience**
**Software Engineer Intern/Contractor: 2nd Chair LLC** 11/2023 – 02/2024; 07/2024 - present
- Assisted in CI website development (https://www.2ndchair.ai/) using Sveltekit on Vercel, Typescript, Tailwind, AWS ECS & S3, including search engine optimization and website analytics.
- Developed Python code to upload and parse PDFs in support of machine learning algorithm.
- Coordinated effort to achieve SOC2 attestation.
- Ideated key performance indicators, reviewed tracking methodologies and off-the-shelf solutions.

**Research Scientist: NorthWest Research Associates, Inc** 2016 – present
- Developed Python code to analyze measured and model data to investigate role of clouds and radiation during foehn and atmospheric river events in Antarctica. See, e.g. here and here.
- Created CLoud and Atmospheric Radiation Retrieval Algorithm (CLARRA), which uses Levenberg-Marquardt inverse retrieval for retrievals from remote-sensing infrared radiation measurements.
- Created websites and webapps and co-developed 8 computational modules that teach multidisciplinary topics using Excel, Jupyter Notebook, or RStudio; several ranked exemplary.
- Developed code to interpolate and compile temperature-dependent refractive indices of water.

**Research Affiliate: University of Santiago, Physics Dept.** 2014 – 2020
- Conducted and led field work at research platform at Chilean Antarctic station.
- Collected, cleaned and analyzed multi-year, continuous atmospheric measurement time series.
- Measured concentrations of soot pollution in snow in Chilean Andes and assessed impact.

**Research Affiliate: University of Idaho, Dept. of Geography** 2012 – 2014
- Developed code for retrieving atmospheric temperature and greenhouse gas concentrations from remote-sensing time series of downwelling infrared radiation.

**Programming Experience/ Projects**
CAMBIO climate model. Created with collaborators as part of an NSF-funded project. 2022 - present
- Allows users to run a simple climate model, and plot output metrics such as atmospheric $CO_2$.
- Created using Poetry, Django, SQLite, Python, and CSS. Hosted on fly.io using gunicorn for the server and WhiteNoise for serving static files. Versioning with Git on GitHub.
- CAMBIO is used in courses “Modeling Earth’s Climate” and “Chemistry in a Changing Climate”.

My web page. Created to share software engineering and scientific programming projects. 2020 - present
- Demonstrates research and projects, and provides links to projects.
- Created using Sveltekit, Tailwind and TypeScript. Version control with Git. Hosted on GitHub pages.

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 how backtracking, AC-3, and heuristics can be used to solve a sudoku puzzle.
- Created using Python; converted to web app using Javascript, CSS, and HTML. Code on GitHub.
- The Sudoku Solver can be used to explore data science, AI and machine learning concepts.