Sophie Oksen

sophie.oksen@gmail.com · (805) 703-0010 · github.com/sophieships · sophieoksen.com · Berkeley, CA

PROFESSIONAL EXPERIENCE

Berkeley, CA — **fermPlot** — Oct 2023 – Present

Founder — part-time through 2025 while caring for family; full-time since 2026

- Founded fermPlot and built its bioprocess data platform, which enables scientists to upload instrument exports (ambr 250, Vi-CELL XR, Cedex Bio HT, NucleoView), plot them across up to four axes, and compare runs. Live Demo: fermplot.com/demo. Technology: TypeScript, Next.js, React, Python, FastAPI, PostgreSQL, Docker, Terraform, AWS, and GitHub Actions.
- Rebuilt the 2023 Dash prototype as a Next.js and FastAPI application — 1,054 merged pull requests since May 2025.
- Built a mechanistic bioreactor simulator for six process families, with kinetic parameters drawn from more than 80 published sources, and used it to score the platform's growth-rate calculation — 2.7% median error on 180 held-out runs.
- Defined 73 data-integrity invariants and probed each on the deployed database (4.75 million measurements, 541 runs). Two probes found violations, and each became a database guard.
- Traced 47-second audit-log stalls under four concurrent uploads to a hash-chain lock and replaced it with an append-only ledger enforced by database privileges.

Berkeley, CA — **Vocal Analyzer** — Mar 2026 – Present

Developer — app.vocal-analyzer.com

- Built Vocal Analyzer, a voice-training app that measures pitch, resonance, and voice quality in recordings and live practice. It runs entirely in the browser — recordings stay on the user's device. Technology: Python, Praat, Pyodide, Rust, WebAssembly, and TypeScript.
- Moved the real-time estimators from Pyodide to a Rust core compiled to WebAssembly — cutting compute per 20 ms audio frame from 1.1 ms to 0.39 ms and live memory from about 190 MB to under 5 MB. Native and WebAssembly builds agree bit for bit.
- Validated pitch tracking against laryngograph references on 400 recordings from 20 speakers (2.6% gross error), and measured test–retest repeatability for every displayed metric on 848 recordings.
- Raised formant accuracy on synthetic vowels with known resonances from 14 to 51 of 60 passing, with no acoustic change to 505 real-speech analyses.

AI-Assisted Engineering — across both products

- Directed teams of AI coding agents (Claude Code and Codex) under written rules — draft pull request, local verification, review by a second model, and required CI before merge. 2,832 merged pull requests across my repositories.
- Built a transcript database and watchers to log all agent transcripts and interactions (more than 17,000 sessions). This has allowed me to search and audit agent work and figure out which instructions and development patterns work (or don't) for each model and effort combination.

Emeryville, CA — **Lawrence Berkeley National Laboratory – Advanced Biofuels and Bioproducts Process Development Unit (ABPDU)** — Aug 2017 – Oct 2021

Senior Research Associate / Bioprocess Engineer — Jan 2020 – Oct 2021
Research Associate / Associate Bioprocess Engineer — Nov 2018 – Jan 2020
Intern / Student Research Asst. — Aug 2017 – Sep 2018

- Worked on over 30 industry partner projects, ranging from early-stage start-ups to large multinational companies, to develop and/or demonstrate fermentation and downstream processes.
- Later in my role, I became the primary point of contact for experiments — interfacing directly with scientists and engineers from industry partners and delegating tasks to team members.
- Held significant project management responsibility — working directly with companies to understand their goals, facilitating technology transfer, and developing statements of work.
- Created standard operating procedures for data export, parsing, and visualization.
- Used models to estimate the fuel properties of potential target molecules for genetic engineering projects to identify promising biofuel candidates. Included on a patent application for production of cyclopropane molecules.

EDUCATION

Johns Hopkins University — M.S., Biotechnology, Concentration in Bioinformatics — Aug 2020 – Aug 2022
University of California, Berkeley, Extension — Advanced Biosciences Certificate — Jan 2019 – Feb 2020
University of California, Berkeley — B.A., Philosophy — Aug 2009 – Jun 2013

PROJECTS AND PUBLICATIONS

- **GitGraph (2026).** Contribution-graph widgets for iOS and macOS in SwiftUI and WidgetKit, released to TestFlight on both platforms.
- **SRA Alignment Pipeline (2023).** Nextflow pipeline for downloading SRA FASTQs, quality control, alignment, and variant calling: github.com/sophieships/sra_alignment_pipeline.
- **Journal Articles and Inventions.** Co-author of three journal articles (Nature Communications 2023, Metabolic Engineering 2021, ACS Sustainable Chemistry & Engineering 2020); co-inventor on one U.S. patent application.

SKILLS

- **Software:** Python, TypeScript, SQL, Rust, Swift, R, Bash; Next.js, React, FastAPI, PostgreSQL, Docker, Terraform, AWS
- **Bioprocess and Bioinformatics:** Fermentation process development, Sartorius AMBR 250 and Biolector, GC-MS, LC-MS, Nextflow