Bethany Pietroniro

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🪪 Profile

I'm a software engineer experienced in a variety of modern languages and full-stack web technologies. From my background in mathematics I derive an analytical and creative approach to problem solving. With a passion for learning and empathetic collaboration, and relentless curiosity about how things work, I enjoy developing intuitive tools and solving complex problems on a team. My most recent project is Umbra, a real-time multiplayer programming platform featuring a scalable WebSocket backend.

💡 Skills

Languages	Tools & Databases	Cloud	Libraries & Frameworks
Fluent: JavaScript, TypeScript, Python, Go, Ruby, SQL, HTML, CSS Familiar: Java, C++, Rust	Git, Github, PostgreSQL, MongoDB, Docker, Nginx, Jest, Minitest, REST APIs, GraphQL (familiar)	AWS, DigitalOcean Droplets, Heroku, Cloudflare Workers/Durable Objects, Kubernetes (familiar)	Node.js, Express, React, Deno, Vite, Next.js, Yjs, Chakra UI, Tailwind CSS, Sinatra, Flask, Gin

💼 Professional Experience

Co-Creator, Software Engineer, *Umbra (umbra-collab.net)* ⧉   2023

Umbra ⧉ is an open-source, browser-based coding platform enabling real time collaborative programming and secure code execution. It is currently in production use as the pair programming platform for Launch School ⧉ .

- Engineered service-oriented backend architecture using Node.js, Express, AWS EC2, and Cloudflare (Workers, Durable Objects, R2)
- Leveraged conflict-free replicated data type (CRDT) frameworks in backend collaboration service to handle state synchronization, and to achieve low-latency automatic conflict resolution for real time collaboration via WebSocket
- Developed a user-friendly React/TypeScript UI that translates user actions into CRDT data for use by collaboration microservice
- Integrated with Piston, an open-source, dedicated code execution engine, for secure code evaluation
- Architected a RESTful API for the application's code library feature, using PostgreSQL and AWS RDS
- Implemented optional user signup and login with AWS Cognito, with corresponding UI conditionals
- Streamlined deployment by containerizing application code with Docker and establishing a CI/CD pipeline with GitHub Actions
- Authored a technical case study ⧉ detailing Umbra's problem domain, engineering decisions, and system design
- Collaborated remotely with a small team of engineers across three time zones (daily standups, pair programming, code reviews)

Software Engineer, *Self-employed*   2022 – present

A selection of open-source projects, including:

- Request Jar: a real-time tool for receiving and monitoring webhooks (DigitalOcean Droplet, Express, Material UI, MongoDB, Nginx, Node.js, PM2, PostgreSQL, TypeScript, React)
- Checkmark: tool for translating PDF contents into Markdown todo lists, preserving indentation (Python, Flask, MongoDB, React)
- Budget Schmudget: a web application for budget planning and expense tracking (Ruby, Sinatra, ERB, SQL, PostgreSQL, CSS)

Computer Science and Mathematics Grader, *Art of Problem Solving* ⧉   2020 – 2022

- Evaluated student mastery of programming fundamentals by grading over 200 challenge problem submissions in Python
- Performed detailed code reviews on student projects, addressing bugs, syntax, object oriented design, and code comprehensibility
- Provided individualized written feedback on students' mathematical proofs as part of a rigorous online curriculum

Collaborative Pianist, *Self-employed/Contract*   2012 – 2022

Performed professionally in concerts and recitals with close-knit ensembles of 2-7 musicians; fulfilled contracts as an orchestral keyboardist and opera repetiteur; served as staff pianist at several conservatories; coached and taught piano and music theory

🎓 Education

B.S., Mathematics, *Indiana University Bloomington* ⧉   2010

Completed honors courses on topics including linear algebra, group theory, cryptography, vector calculus, differential equations

Computer Science coursework, *Johns Hopkins University*

Introduction to Programming in Java (A average); Intermediate Programming in C/C++ (audit)

Launch School, *Software Engineering (launchschool.com/ employers)* ⧉   2022 – 2023

Multi-year, mastery-based software engineering curriculum on fundamentals of programming, networks, databases, system design