

Marwan Zaarab

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EXPERIENCE

Open Source Contributor

Feb 2024 – present | Remote

ZenML

- Developed a **VSCode extension** to streamline ML workflows and **MLOps**, utilizing a custom **Python**-based **LSP** server to bridge the ZenML Python library with the extension's TypeScript codebase.
- Implemented real-time monitoring with the **watchdog** library to reflect ZenML environment changes in the VSCode extension, using an EventBus for immediate UI updates upon configuration modifications.
- Achieved direct integration with the ZenML library, removing the dependency on ZenML's FastAPI server for enhanced version management flexibility and leveraging the user's local installation for operations.
- Implemented a testing framework for **AWS** deployments, leveraging **LocalStack**, **Terraform**, **Docker**, and **GitHub Actions** for **CI**, complete with detailed developer documentation.

Co-Creator; Software Engineer

May 2023 – present | Remote

Pennant | pennant-notebook.github.io

- Developed "Pennant", a collaborative computational notebook, integrating a conflict-free replicated data type (**CRDT**) framework for real-time document synchronization with minimal latency.
- Led **UI/UX** design using **TypeScript**, **React** +hooks, **React-Query**, and **Recoil** for advanced state management.
- Built a **Flask**-based async execution engine with **Celery**, **Redis**, and **RabbitMQ** for optimal request handling and fast frontend response times.
- Implemented a comprehensive security strategy for executing untrusted user code, combining language sandboxing, **Docker** hardening, and least privilege principles, with **gVisor** for containerized environments.
- Optimized **WebSocket** communication by reducing client connections from linear to constant scale, improving overall system scalability and reducing server resource consumption by nearly 90%.
- Designed a custom nested CRDT data structure, achieving a 60% reduction in object size that allowed for more efficient state synchronization.
- Implemented a stateful backend via **consistent hashing** using **Nginx** and containerized Backend WebSocket Provider code for deployment to **AWS (Docker, ECR, ECS Fargate)**.

Freelance Developer

Jan 2020 – Jan 2023 | Chicago, IL

Self-Employed

- CloudRounds – Permissions-Role-Based calendar platform (**React**, **TypeScript**, **Prisma**, **GraphQL** with Relay)
- Jabr – Discord-like chat and VoIP app (**Next.js**, **Typescript**, **Prisma**, **PostgreSQL**, **Supabase**, **Socket.io**, **Vercel**)
- SnackBin – Developer toolkit for receiving and debugging webhooks (**Node.js**, **PostgreSQL**, **Socket.io**, **Docker**)
- SymptomOverflow – web app for analyzing symptoms and generating differential diagnoses (**MERN stack**)
- CHF Manager – iOS app for the management of Congestive Heart Failure (**Swift**, **SwiftUI**)

SKILLS

Languages

JavaScript/TypeScript, Node.js, Ruby, Go, Python, SQL, HTML/CSS, HCL, Shell

Libraries/Frameworks

React.js, Redux, Express.js, Next.js, Handlebars, jQuery, Sinatra, Erb, Ruby on Rails, Tailwind

Infrastructure

AWS (EKS, EC2, ECS Fargate, IAM, DynamoDB, S3, SDK), Terraform, Digital Ocean, Serverless

Other Technologies

Git/GitHub Actions, Docker, Postgres, Redis, Nginx, REST, GraphQL, MongoDB, WebSockets

EDUCATION

Software Engineering Capstone

Dec 2021 – Aug 2023 | Remote

Launch School

Multi-year, mastery-based learning program focused on software engineering fundamentals

M.D.

May 2015 – Oct 2019 | St. Kitts & Nevis

Windsor University School of Medicine