# Kshitiz Agrawal

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## EDUCATION

**Vellore Institute of Technology, Bhopal** *Bhopal, India*
*B.Tech in Computer Science Engineering & Specialisation in AI & ML; CGPA: 8.5* Aug '20 - Jul '24

## EXPERIENCE

**FinBox** Backend Engineer *Jan'24 - Present (Full Time), Oct '23 - Dec'23 (Intern) | Bengaluru, IN*

**Octopus & OctoDash** | *Internal HTTP Proxy with DSL & Management Dashboard*

- Architected a comprehensive internal HTTP proxy system featuring a custom domain-specific language (DSL) that enables declarative configuration of encryption protocols, authentication flows, webhooks, and routing logic.
- Developed **OctoDash**, a full-stack management dashboard from the ground up, streamlining service onboarding and providing intuitive controls for proxy configuration and monitoring.

**DataDancer** | *In-Memory Workflow Engine & JSON Transformer*

- Developed a Go library implementing the Serverless Workflow Specification for in-memory workflow execution without external dependencies, eliminating the overhead of tools like Temporal.
- Engineered a highly impactful, config-driven JSON transformation engine with support for custom function activities, now utilized across multiple microservices.
- Designed an extensible architecture enabling microservices to inject their own activities, loggers, and OpenTelemetry instrumentation, providing maximum flexibility while maintaining zero external dependencies.

**Pickle** | *Multi-Tenant Configuration Management Service*

- Engineered a centralized configuration management platform addressing critical needs for version control and scheduled deployments, built using Go microservices with gRPC communication.
- Designed and implemented a hierarchical RBAC framework with tenant-scoped permissions, role inheritance across namespaces, and comprehensive audit logging for compliance tracking.
- Established complete infrastructure automation using Terraform and Helm, integrated with OpenTelemetry for distributed tracing and metrics collection across the entire stack.
- Built a responsive React-based frontend providing intuitive interfaces for configuration versioning, scheduling, and namespace management.

**Firefly** | *Scalable Webhook Delivery System*

- Created a robust, multi-tenant webhook delivery platform to centralize and standardize webhook processing across organizational services, implementing configurable retry strategies.
- Integrated OAuth authentication mechanisms and dead letter queue handling for failed deliveries, ensuring reliable event propagation.
- Deployed production-ready infrastructure using Terraform and Helm with full observability through OpenTelemetry traces and metrics.

**Workflow Orchestration Platform** | *Temporal-Based Business Process Engine*

- Built a sophisticated orchestrator that parses Serverless Workflow specifications and executes durable, fault-tolerant business workflows using Temporal's distributed workflow engine.
- Designed config-driven workflow definitions enabling non-developers to construct complex business logic without code modifications.
- Maintain and enhance the **Serverless Workflow Editor** tool at FinBox, improving developer productivity in workflow design.
- Active open source contributor to the **Serverless Workflow Go SDK**, helping advance the ecosystem.

**Vendor Switch** | *Intelligent Runtime Service Selection System*

- Pioneered an adaptive vendor selection system that dynamically routes requests to optimal service providers based on real-time performance metrics aggregation, improving reliability and reducing latency.
- Implemented intelligent failover mechanisms and performance scoring algorithms to automatically identify and switch to the best-performing vendors for critical services.

**Cyphr** | *Custom Code Execution Lambda*

- Developed a lightweight AWS Lambda alternative in Go leveraging Go's plugin system to enable secure, isolated custom code execution without container overhead.

## PROJECTS

**Online Code Playground with Realtime Collaboration**                    *May - Jun '22*

- Created a full-stack application which allows users to **write and run code directly in their browsers**
- Allows seamless **collaboration** with peers in **real-time** across 4 languages (**NodeJS, Python, C++, Java**)
- Uses the **Docker Engine API** to build **containers on-demand** to allow code compilation in an **isolated** environment
- Supports conflict free editing using **CRDT** algorithm with auto-completion using **language server protocols (LSP)**
- **Tech Stack:** Typescript, Nodejs, MySQL, Docker, Reactjs, WebSocket, Redis, Monaco, YJS
  - *Links:* LIVE: **ide.kshitizagrawal.in**    REPOSITORY: **github.com/Kshitiz1403/Collaborative-IDE**

## TECHNICAL SKILLS AND INTERESTS

**Languages**: GoLang, TypeScript, Javascript, Java, Python, C++
**Developer Tools**: Kubernetes, Docker, Temporal, Kafka, Nginx
**Technologies**: NodeJS, ReactJS, React Native, GraphQL, Redux, WebSocket
**Cloud**/**Databases**: PostgreSQL, MySQL, MongoDB, Redis, AWS, Azure, GCP, Oracle Cloud
**Areas of Interest**: Distributed Computing, Database Internals and Computer Science Internals

## ACHIEVEMENTS

**Guest Speaker at College Fest**                    *Feb '23*
Delivered an impactful web-dev roadmap talk to 400+ attendees in a flagship event

**GDSC Club**                    *May '22*
Judged HackDSC web projects, assessing 100+ participants

**Competitive Programming**                    *Jan '22*
266/10534 (Top 2%) Scaler Academy Contest