

Ayush Kumar

AI Engineer | Full Stack Engineer (GenAI, Java, TypeScript)

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Summary

AI and Full Stack Engineer with 5 years of production experience across enterprise commerce, banking, and telecom. Builds Generative AI features end to end – RAG pipelines, agentic AI workflows, MCP servers, and guardrails – on a backend-heavy foundation of Java 21 / Spring Boot microservices and Node.js with TypeScript. Author of **Shirube**, an open-source TypeScript AI agent SDK published on npm. Delivers full stack with React, Next.js, PostgreSQL/pgvector, Redis, Kafka, and Docker.

Technical Skills

AI & GenAI:	LLM Integration (OpenAI, Claude, Gemini), Agentic AI, Agent SDKs, Tool / Function Calling, RAG, Hybrid Search (pgvector + FTS + RRF), Embeddings, Vector DBs (pgvector, Qdrant), MCP Servers, LangChain, Spring AI, Guardrails (Prompt Injection, Jailbreak, PII Redaction), Prompt Engineering, Structured Output, SSE Streaming
Backend:	Java (8–21), Spring Boot 3.x, Spring Security / Data JPA / Batch / Cloud, Node.js, Express.js, TypeScript, REST, GraphQL (PostGraphile), Microservices, Event-Driven Architecture, CQRS, SAGA, OAuth 2.0 / JWT / RBAC
Frontend:	React.js, Next.js (App Router, SSR/SSG), TypeScript, Redux, Tailwind CSS
Data & Messaging:	PostgreSQL, pgvector, MongoDB, Redis, Oracle, MySQL, PL/SQL, Apache Kafka, JMS
Cloud & DevOps:	AWS (EC2, S3, Lambda, RDS), Docker, Kubernetes, Jenkins, GitHub Actions, CI/CD, Git, JUnit, Mockito, Agile/Scrum

Professional Experience

Senior Software Engineer - I

Apr 2025 – Present

HCL Software – Pune, India

HCL Commerce-Plus | Java Full Stack + Node.js (TypeScript) + GenAI Integration

- Built agentic AI workflows and an internal MCP server exposing REST/GraphQL operations as typed, agent-callable tools with schema validation, human-in-the-loop approval, and guardrails for prompt injection.
- Developed cloud-native Java 21 / Spring Boot 3.x microservices (API Gateway, Service Discovery, Circuit Breaker) secured with Spring Security, OAuth 2.0, JWT, and RBAC.
- Shipped Node.js and TypeScript services with PostGraphile GraphQL auto-generated from PostgreSQL schemas plus Redis caching, and React / Next.js frontends in TypeScript using SSR and SSG.

Software Development Senior Analyst

Oct 2024 – Apr 2025

Accenture – Noida, India

Central Bank of UAE (CBUAE) – Core Banking Modernization

- Built fault-tolerant Spring Boot microservices and secure REST APIs using Spring Cloud, Eureka, and Resilience4j with Circuit Breaker and Retry patterns.
- Delivered Spring Batch and Quartz jobs for daily transaction reconciliation and regulatory reporting; applied Kafka-based Event-Driven Architecture and CQRS with TDD (JUnit, Mockito).

Software Developer

Aug 2021 – Oct 2024

Amdocs – Gurugram, India

Order Management System (OMS) – Telecom Platform

- Developed enterprise Java/J2EE services with EJB and WebLogic for telecom order processing and provisioning; integrated SOAP APIs and JMS asynchronous messaging.
- Refactored legacy monolithic modules into modular MVC components, tuned Oracle SQL/PL/SQL for large datasets, and maintained Jenkins/Maven CI/CD pipelines.

Projects

ChaiBook LM – Source-Grounded RAG Research Workspace

[Live](#) | [GitHub](#)

- Built a NotebookLM-style RAG platform in Next.js 16 and TypeScript that ingests PDFs, URLs, YouTube, email, Drive, and MCP snapshots into notebook-isolated PostgreSQL corpora.
- Engineered hybrid retrieval combining pgvector cosine similarity with PostgreSQL full-text search, fused by Reciprocal Rank Fusion and source-diversified, returning clickable citations with per-chunk scores.
- Layered memory across Redis short-term context, pinned facts and episodic embeddings in pgvector, a background knowledge graph, and optional Mem0; deployed with Docker behind Traefik and a private Caddy proxy.

mAI-school – Multi-Tenant AI School Management SaaS

[Live](#) | [GitHub](#)

- Built a multi-tenant SaaS with a subdomain-per-institute tenant resolver, PostGraphile auto-generated GraphQL over PostgreSQL, row-level security, and JWT-scoped role sessions for admin, principal, teacher, and student.
- Added GenAI assists for attendance and exam analytics, report drafting, and personalised student performance summaries for parents; self-serve onboarding with emailed sign-in links, fully Dockerized.

Other open source: [Shirube](#) ([GitHub](#)) – TypeScript AI agent SDK on npm: agent loop, default-on guardrails, five separated memory layers, multi-agent handoffs, bidirectional MCP, and OpenAI/Claude/Gemini fallbacks. [MCP Mermaid ER Server](#) – MCP server with 12 agent tools turning ER diagrams into PostgreSQL DDL and REST/GraphQL CRUD APIs. [Notebook-ai](#) – Java, Spring AI, and Qdrant RAG with grounded citations. [PostGraphile Java](#) – Spring Boot starter generating Relay GraphQL from a PostgreSQL schema.

Education & Certifications

B.E. in Computer Science – MMIT, Savitribai Phule Pune University, Pune (CGPA: *July 2017 – June 2021* 8.0/10.0)

Certifications: Java Spring Framework with Spring Boot (Udemy) | Microservices with Spring Boot (Coursera) | Docker & Kubernetes (Udemy) | Python Programming (Microsoft) | Data Analytics (IBM)

Achievements

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- Recognised with the **Rising Star Award** at HCL Software; mentor junior engineers on Spring Boot, design patterns, and GenAI integration.
 - Published an npm AI agent SDK and maintain 13+ public repositories across TypeScript, Java, Python, and Rust.