

Kumar Gaurav

Backend / Full Stack Engineer

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linkedin.com/in/kumar-gaurav-cs — github.com/D3S-Gaurav — Codeforces: ATHEUS — LeetCode: ATHEUS_007

Skills

Languages: Python, Java, JavaScript, TypeScript, Go, C++, SQL, Bash

Web & Frameworks: HTML, CSS, React, Next.js, Node.js, Express.js, RestAPI, Socket.IO, Zod

Databases: MySQL, PostgreSQL, MongoDB (NoSQL), Prisma

Dev Tools: Git, GitHub, GitHub Actions (CI/CD), Docker, VS Code, Linux

Concepts: Data Structures & Algorithms, OOP, Distributed Systems, REST APIs, WebSockets, TCP/IP, Agile/SDLC

Education

Birla Institute of Technology, Mesra — Ranchi, Jharkhand

Aug 2023 – May 2027 (Expected)

B.Tech in Computer Science and Engineering, CGPA: 7.88/10

Experience

Backend Engineer — Soil Suitability Platform

Jan 2026 – Present

Agri-Tech / AI Platform — Python, FastAPI, Next.js, React, PostgreSQL, Gemini API — Remote

- Split the FastAPI backend into 3 isolated, stateless microservices (sensor ingestion, crop lookup, Gemini-powered analysis) with a dedicated health-check endpoint, so a model outage degrades only one feature instead of the whole app.
- Locked down the AI analysis route against prompt injection using secure coding practices — allow-listing and type-casting the 5 expected sensor fields, discarding injected keys before they reached the prompt.
- Redesigned a React/Next.js dashboard on a 500ms refresh cycle, giving users live NPK/pH/moisture/climate readings and per-crop suitability verdicts for faster in-field decisions.
- Wrote a tolerance-buffered rules engine (10% band on NPK, 0.3 on pH) mapping nutrient deficiencies to a deduplicated organic-amendment lookup across the full crop list, cutting manual soil-report review time.

Open Source Contributor

Jan 2026 – Present

Distributed systems & CLI tooling across 4 upstream projects (Go, TypeScript, PHP), 18k+ combined stars — Remote

- Replaced fatal `os.Exit` calls with propagated errors across 4 files in Karmada's (5.5k+ stars, CNCF multi-cluster Kubernetes orchestrator) `karmadactl` CLI, making process-terminating paths recoverable and testable.
- Developed and merged 2 PRs into Oppia (6.7k+ stars, Angular/TypeScript) after maintainer code review, earning merge access to review and land future PRs for the Dev Workflow team.
- Established a custom ESLint rule that blocks undocumented `ViewEncapsulation.None` at lint time, turning a recurring style-leak bug class into a hard CI failure.
- Fixed 3 CI/CD defects in Joomla CMS's (5.1k+ stars) GitHub Actions pipeline — artifact-name collisions, a flaky Cypress wait condition, and a `pcntl_waitpid` bitwise bug — and shipped a Docker/Vagrant base-box upgrade (Ubuntu focal to jammy) for FOSSology (1.0k+ stars).

Projects

ChatFlow — Real-Time, Distributed Group Chat

May 2026 – Jun 2026

github.com/D3S-Gaurav/chat-fullstack — TypeScript, React, Express, Socket.IO, Prisma, PostgreSQL

- Built a stateless real-time chat HTTP/WebSocket gateway with a fully typed Socket.IO event contract via TypeScript generics, making every emit/on call compile-time checked.
- Secured authentication and transport with Zod validation on every payload, scrypt password hashing, timing-safe comparison, tiered rate limiting, and boot-time environment validation.
- Added cursor-based pagination and role-based access control (ADMIN/MODERATOR/MEMBER) with orphan-admin protection, plus multi-tab presence tracking.
- Validated the system with 32 Vitest unit and integration tests across 6 suites in CI (GitHub Actions) against live PostgreSQL 17, plus a k6 load-testing harness for WebSocket stress.

Loom — Real-Time Multi-Agent LLM Orchestration Platform

Apr 2026 – May 2026

https://github.com/D3S-Gaurav/Loom — Next.js, TypeScript, Go, Kafka, gRPC, Redis, PostgreSQL, Stripe

- Architected an LLM orchestration engine that decomposes a goal into a dependency-aware task DAG, running specialist agents concurrently with Zod-validated structured outputs and mode-aware output validation with automatic revision loops.
- Authored a real-time event pipeline (Kafka → Go microservice → gRPC/WebSocket/Prometheus) streaming orchestration state to a React Flow UI over a WebSocket-primary, SSE-fallback transport with sequence-numbered, idempotent replay.
- Engineered a non-blocking Go fan-out hub with per-subscriber buffered channels that evicts slow consumers instead of stalling the Kafka poll loop, verified with `-race` tests over gRPC bufconn and live WebSocket handshakes.
- Designed mode-scoped token budgets (Low/Auto/Max) across planner handoff, validator feedback, and synthesis corpora to bound LLM context cost, plus SSRF-safe GitHub fetching and prompt-injection-resistant vision context extraction.

Achievements

- Solved 500+ DSA problems across Codeforces and LeetCode.
- Reached Rank 682 in a Codeforces Div. 2 Round.
- Finalist, SEBI Hackathon — a national-level hackathon hosted by the Securities and Exchange Board of India.
- Gold Level, WorldQuant BRAIN — 10,000+ points across 8 peer-reviewed alphas.