

KUSHAGRA GUPTA

Backend Developer Intern | Software Engineering Intern

Lucknow, India | +91 7668443722 | kushuvikas@gmail.com

github.com/kush1jpeg | kush1jpeg.github.io | linkedin.com/in/kushagra-gupta | leetcode.com/kush1jpeg

SUMMARY

Pre-final-year Computer Science undergraduate who builds and debugs real, production-shaped backend systems: media/telemetry pipelines, async job orchestration, caching layers, and infrastructure-level HTTP routing. Comfortable operating with ambiguity in unfamiliar stacks; iStream project below was learned, broken, instrumented, and fixed largely through direct systems debugging rather than tutorials. Looking to bring that same operating style to geospatial, telemetry, and AI-assisted product engineering.

TECHNICAL SKILLS

- **Languages:** TypeScript, JavaScript, Python, C, C++
- **Backend & APIs:** Node.js, Express.js, REST APIs, WebSockets, Socket.IO, JWT, OAuth, asynchronous job pipelines, FFmpeg, MediaMTX
- **Infra, Networking & Delivery:** Nginx, Docker, Docker Compose, RabbitMQ, Caddy, Cloudflare R2, Linux
- **Data & Caching:** MongoDB, PostgreSQL, Redis, SQLite
- **Testing & Fundamentals:** Vitest, mongodb-memory-server, redis-memory-server, integration testing of async/eventually-consistent systems, Data Structures & Algorithms, OS, DB Internals, Distributed Systems

PROJECTS

iStream - Distributed Live-Streaming & VOD Platform | Sept 2025 - Present | github.com/kush1jpeg/iStream

Node.js, TypeScript, MediaMTX, FFmpeg, Nginx, RabbitMQ, Redis, MongoDB, Docker, Cloudflare R2

- Architected Twitch-style streaming backend with RTMP ingest, stream-key authentication, adaptive HLS pipeline with multi-bitrate transcoding, rolling segment output, MongoDB persistence, Redis live-state cache, Socket.IO real-time communication and docker compose setup.
- Served live and VOD playback without breaking relative-path HLS manifests or leaking storage credentials; routed VOD requests through Nginx proxy_pass to presigned Cloudflare R2 URLs (via a custom X-Vod-Url header), while serving live segments directly from local disk.
- Designed VOD archival pipeline using Cloudflare R2 uploads, retry counters, RabbitMQ DLX/DLQ failure handling, and local segment cleanup to persist stream recordings without unbounded disk growth.
- Built autoscaled FFmpeg worker pool using RabbitMQ job dispatch, Redis heartbeats/leases, worker capacity tracking, and inactivity cleanup to process live streams reliably and recover from dead workers.
- Kept live streams self-healing under worker failure by building an autoscaled FFmpeg worker pool with RabbitMQ job dispatch, Redis heartbeat/lease tracking, and automatic dead-worker recovery.
- Found and fixed a silent data-loss bug pre-production by building an integration test suite (Vitest, mongodb-memory-server, redis-memory-server): insertMany with ordered:false was throwing MongoBulkWriteError after partial inserts, so Redis dedupe tracking silently never ran for documents that had, in fact, been saved, fixed by salvaging err.insertedDocs in the catch path.

komi.sh - UNIX-like Shell in C | Jun 2025 - Jul 2025 | github.com/kush1jpeg/komi.sh

C, POSIX syscalls, fork/execvp, dup2, pipe(), hand-written lexer/parser

- Implemented shell execution engine with process execution, I/O redirection, pipe chaining, background jobs, and SIGCHLD cleanup over a hand-written lexer, parser, and AST interpreter.
- Built context-aware Linux prompt using getcwd, uname, access, and direct .git/HEAD parsing to detect project type and Git branch without spawning external subprocesses.

TypeFight - Real-Time Multiplayer Typing Battle | Jul 2025 - Sept 2025 | github.com/kush1jpeg/typeFight

TypeScript, Node.js, WebSockets, Redis, React, Three.js, Zustand

- Built two-player real-time game backend with room/session management, WebSocket events, ready-state synchronization, countdown flow, reconnect recovery, and Redis-backed room state.
- Implemented per-word tokenization, Levenshtein-distance accuracy scoring, live opponent ghost-cursor updates, and React/Zustand frontend state management.

NOT_chip8 - CHIP-8 Emulator in C | Sept 2025 | github.com/kush1jpeg/NOT_chip8

C, SDL2, CMake, virtual machine architecture

- Implemented a full fetch-decode-execute cycle for 35 opcodes with 60Hz timers, synchronized sound, SDL2 graphics, and hex-keypad input, emulating the work of an 8-bit machine;

OPEN SOURCE

- **CodeGraphContext - MCP Server for AI Coding Assistants (3.9k+ GitHub stars)** CodeGraphContext/pull/100
Shipped a merged Cline AI coding-agent integration for a codebase-indexing MCP server/CLI, validated end-to-end inside a VS Code OSS build, direct experience extending AI coding-agent tooling.

EDUCATION

Amity University, Lucknow

Bachelor of Technology, Computer Science | Aug 2024 - May 2028 | CGPA: 7.42