

# Sudip Roy

Full-Stack Software Engineer

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## Summary

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Full-stack software engineer with strong backend and systems focus. Built and operated a multi-service platform for a 50,000+ member Discord community with 2,000+ daily active users across Python, Rust, and TypeScript systems. Comfortable owning architecture, APIs, databases, deployments, and production debugging end to end.

## Technical Skills

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**Languages:** Python, Rust, TypeScript, SQL, JavaScript

**Frameworks & Tools:** Next.js, React, Axum, Actix, gRPC, discord.py, Docker, Git, GitHub Actions

**Databases & Caching:** PostgreSQL, Redis, MongoDB, SQLite, libSQL

**Infrastructure:** AWS, Cloudflare, Linux, static site deployment, service-oriented architecture

## Experience

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### Software Developer

2020 – Present

Worldwide Discord Platform

Full Stack / Systems

- Built and maintained a production community platform serving 50,000+ members and 2,000+ daily active users across Python, Rust, and TypeScript services.
- Designed a three-layer architecture with Python handling the Discord gateway, Rust owning the data and financial path, and Next.js powering dashboard and admin workflows.
- Introduced gRPC communication between services to separate bot logic from database and transaction logic, improving maintainability and service boundaries.
- Evolved storage from raw JSON to MongoDB, Redis, PostgreSQL, and embedded libSQL based on scaling, concurrency, and latency failures in production.
- Embedded libSQL inside the Rust process to remove network round-trips for latency-sensitive operations and improve transaction path performance.
- Implemented economy systems, moderation tooling, games, event workflows, and real-money purchase handling with Axum and PayPal webhooks, then strengthened logging, recovery, and test coverage after cache-related incidents.

## Projects

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### Pattern Pursuit

2023

github.com/drlove2002/pattern\_pursuit

Rust, TypeScript, Redis, Docker, AWS

- Built an interactive prediction game using a Rust and Actix backend, a TypeScript frontend, and Redis for real-time game state.
- Applied 5-gram statistical language modeling so players could compete against a model that updates from gameplay.
- Containerized the application with Docker and deployed it on AWS.

### Sudoku Solver Research

Active

github.com/drlove2002/sudoku\_solver

Rust, Criterion, Algorithm Research

- Building a modular Sudoku-solving and benchmarking system in Rust to evaluate interchangeable solving components on a large real-world dataset.
- Focused on minigrad-based constraint propagation, permutation graph construction, benchmarking, and graph-based result visualization rather than a single hardcoded solver path.

## Education

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### M.Sc. in Computer Science

Final Year

University of Calcutta

West Bengal, India

### B.Sc. in Computer Science

2020 – 2023

University of Calcutta

West Bengal, India

## Additional

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**Focus Areas:** distributed systems, backend engineering, API design, database architecture, systems reliability, full-stack product development

**Languages:** Bengali (Native), English (Fluent), Hindi (Intermediate), German (A1)