

ARITRA SARKAR

Kolkata, West Bengal, India | 📞 +91 6289982251 | ✉ aritrasarkar2004nov@gmail.com

[LinkedIn](#) | [GitHub](#) | [Portfolio](#) | [Codeforces](#) | [LeetCode](#) | [CodeChef](#)

Education

Jadavpur University

B.E. in Information Technology (CGPA: 8.35)

Oct 2023 – May 2027

Kolkata, India

Calcutta Boys' School

ISC: 90% (2023) · ICSE: 98% (2021)

2021 – 2023

Kolkata, India

Projects

Venue Ops Platform | *React, TypeScript, Zustand, TanStack Query, WebSockets, Konva* | [Overview](#) | [Link](#) Dec 2025 – Present

- Built the venue-operations dashboard of a **production** nightlife booking platform alongside two working industry engineers — owning nine feature verticals (events, messaging, inventory, artists, add-ons, menu, merch, issue tracking, QR redemption) through pull-request-driven development and organization-wide code review.
- Implemented real-time messaging, live reactions, and presence over a **single multiplexed WebSocket** service — exponential-backoff reconnection, per-event listener fan-out, and Zustand-driven optimistic updates that fall back to HTTP when the socket is down.
- Solved bi-directional cursor pagination in a virtualized chat window with an epoch-guard scheme that discards stale page responses, eliminating duplicate React keys during jump-to-message; cut redundant HTTP calls via TanStack Query key hierarchies, targeted invalidation, and in-flight request deduplication.
- Developed an interactive Canvas (Konva) floor-plan editor — rectangle, circle, and polygon tools over resolution-independent normalized coordinates — letting venue teams map tables onto their own floor plans without developer help; also shipped a shareable ticket-transfer flow with a six-state view machine on the customer-facing site.

Algora | *React, TypeScript, Node.js, PostgreSQL, Redis, Docker, WebRTC* | [GitHub](#) | [Overview](#) June 2026 – July 2026

- Architected an asynchronous judging pipeline — a Redis job queue feeding a decoupled worker that runs untrusted submissions in ephemeral Docker sandboxes (no network, dropped capabilities, read-only filesystem, 256 MB / 1 CPU limits) — returning per-test verdicts with runtime and memory stats while the API stays non-blocking.
- Built the surrounding full-stack competitive programming platform: user-authored problems with hidden test cases, per-problem leaderboards, and submission history across C++, Python, and JavaScript.
- Designed a heuristic complexity estimator ranking leaderboard solutions by estimated time/space complexity, derived from AST analysis of loop nesting, recursion shape, and library-call costs.
- Implemented peer-to-peer video, voice, and screen sharing with WebRTC, hand-rolling the WebSocket signaling server for offer/answer and ICE exchange.

PharmaFlow | *React Native, Node.js, Prisma, PostgreSQL, PaddleOCR, GenAI* | [Overview](#) Feb 2026 – Mar 2026

- Built a B2B pharmacy inventory platform — React Native mobile app plus web dashboard — digitizing stock tracking and store operations; **in closed testing with 30 pharmacy stores**.
- Developed an invoice-digitization pipeline combining PaddleOCR with Google GenAI post-processing to auto-extract batch numbers, expiry dates, and MRPs from supplier invoices.
- Designed a JWT/bcrypt-secured RBAC API with role-scoped endpoints and offline-tolerant synchronization between the mobile client and backend.

Buyceps — AI Shopping Assistant | *Next.js, FastAPI, CrewAI, FAISS* | [GitHub](#) | [Demo](#) Jul 2025 – Aug 2025

- Built a multimodal AI shopping assistant accepting text, voice, and image queries and returning ranked, personalized product recommendations.
- Architected a multi-agent recommendation pipeline with CrewAI — vision-analysis, product-search, and response-generation agents behind a single /agent/query API with parallel execution via thread pooling.
- Implemented hybrid semantic search over an Amazon catalog: MiniLM sentence-transformer embeddings in FAISS fused with Llama-4 vision features, ranked by multi-factor relevance scoring.

Achievements

- Qualified for the **Indian National Mathematical Olympiad (INMO 2022)** — top ~1% of RMO qualifiers nationwide; also qualified the Indian National Physics Olympiad (INPhO 2023).
- LeetCode **Knight** (top ~5% globally)
- Codeforces peak **1615 (Expert)**
- CodeChef peak **1755 (3-star)**
- 1st Place**, HackForge Hackathon.

Technical Skills

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

Backend & Infrastructure: Node.js, Express, PostgreSQL, Redis (caching, job queues), Prisma, MongoDB, Docker, REST APIs

Code Quality: code review, pull-request-driven development, TypeScript strict mode, schema validation (Zod)

Networking & Real-Time Systems: WebSockets, WebRTC (signaling, offer/answer, ICE), HTTP, TCP/IP fundamentals

Security: container isolation for untrusted code, JWT authentication, bcrypt, role-based access control

Frontend & Mobile: React, Next.js, React Native (Expo), TanStack Query, Zustand, Tailwind CSS

AI/ML Integration: Google GenAI APIs, PaddleOCR, CrewAI, FAISS, sentence-transformers, LLM data-extraction pipelines

CS Fundamentals: Data structures & algorithms, operating systems, computer networks, OOP, databases