Deep Sarkar

+91 9861205788 deepsr2003@gmail.com deepsr2003 deepsr2003 Portfolio

Education

National Institute of Technology, Rourkela **2022 - 2026**
Bachelor of Technology – Biomedical Engineering Rourkela, India

Work Experience

CodTech IT Solutions Pvt. Ltd. **May 2025 – Jul 2025**
Backend Engineering Intern

- Engineered a real-time chat application backend using Node.js, Express, and WebSockets, achieving an average message latency of under 100ms for over 1,000 concurrent users.
- Designed and implemented a secure RESTful API for a micro-blogging platform with PostgreSQL, featuring JWT-based authentication and role-based access control.
- Established a CI/CD pipeline with Docker and GitHub Actions for automated testing and deployment, and authored Jest unit tests to achieve 92% code coverage.

Projects

NexusPipe | Distributed Real-Time Analytics Pipeline **Node.js, Python, Kafka, Redis, MySQL, WebSockets**
GitHub Link

- Designed a distributed, event-driven analytics pipeline using Node.js & Python microservices communicating asynchronously via Apache Kafka to ensure scalability and fault tolerance.
- Engineered a high-throughput ingestion service in Node.js capable of handling traffic spikes by decoupling client requests from backend processing, immediately returning a ‘202 Accepted‘ response.
- Implemented a Polyglot Persistence strategy, leveraging Redis for sub-millisecond real-time counters and MySQL for durable, ACID-compliant storage of historical event data.
- Developed a hybrid API gateway serving historical trends via REST and pushing live data updates to clients in real-time using WebSockets powered by a Redis Pub/Sub stream.

Low-Latency C++ Matching Engine **C++17, Memory-Mapped I/O, Bit-Twiddling, Intrusive Lists**
GitHub Link

- Designed and benchmarked four evolving versions of a limit-order book, progressing from a naïve STL-based prototype (5.8 s) to a cache-aware, mmap-accelerated engine (78 ms) that sustains sub-100 ms latency under 1 k concurrent clients.
- Eliminated dynamic memory allocation from the hot path with a lock-free object pool and intrusive linked lists, reducing CPU cache misses and boosting throughput by 70× on dense workloads.
- Replaced linear best-bid/ask scans with constant-time bitmap look-ups using `__builtin_clzll`, ensuring robust O(1) performance even on extremely sparse price levels.
- Hardened the system against I/O bottlenecks via memory-mapped file ingestion, shrinking data-load times from seconds to microseconds and removing file-stream parsing overhead.

Micro Telegram | Real-Time Chat Application **React, Node.js, WebSockets, MySQL** **GitHub Link**

- Built a full-stack Telegram clone supporting instant messaging, group chats, and real-time user presence indicators.
- Engineered a scalable WebSocket layer to efficiently manage state and broadcast messages for over 500 concurrent chat rooms.
- Integrated real-time typing indicators and message ‘seen‘ status to enhance interactivity and user engagement.
- Containerized the Node.js backend using Docker, creating a portable and consistent environment for development and deployment.

Technical Skills

Languages: JavaScript (ES6+), TypeScript, Python, C++, SQL , Java
Frontend: React, TailwindCSS, HTML5, CSS3
Backend: Node.js, Express, WebSockets
Databases: PostgreSQL, MySQL, Redis, Supabase
DevOps & Cloud: Docker, Apache Kafka, GitHub Actions, Firebase, Cloudflare Workers
Tools: Git, Linux, Jest, Postman, Agile Methodologies

Achievements

Competitive Programming: Achieved **Top 22%** (7.8k/35k+) in Meta Hacker Cup 2024 and **Top 16%** (6.8k/42k+) in Codeforces Div. 2. Profile: deepsr2003