

SUBHRANSU PRIYARANJAN NAYAK

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Education

Indian Institute of Technology (IIT) Bhubaneswar

2021 – 2026

Integrated B.Tech in Mechanical System Design Engineering

CGPA: 8.3 | Odisha, India

Achievements

- Competitive Programming & DSA: Solved over 1,500+ problems | [LeetCode](#): Peak Rating 1934 (Top 4%, 1000+ Problems solved) | [CodeChef](#): Peak Rating 1682 (3-Star) | [Codeforces](#): Peak Rating 1345 (Pupil) (200+ Problems solved).
- Bronze Medalist: Inter IIT Tech Meet 10.0 (2022): Secured 3rd place for IIT Bhubaneswar across 23 IITs [\[Certificate\]](#).
- Intra-IIT Bhubaneswar Hackathon: 3rd place in Game Dev (UE5) [\[Code\]](#) | 3rd place in WebDev (ERP System) [\[Code\]](#).
- IIT Bhubaneswar's Official Mobile App: Contributed to the development of a cross-platform mobile app [\[Code\]](#) for GC 2024.

Experience

Data Engineering Intern | [HealthyDay \[Offer Letter\]](#)

Hybrid, India | Nov 2025 – Present (3Mo. + 6Mo. Extended)

- Engineered a BigQuery-based data processing layer for a platform serving 600K+ registered students, integrating Firestore and relational data by developing 50+ reusable SQL views with CTEs, window functions, JSON parsing, regex classification, and temporal deduplication.
- Designed and optimized 150+ complex SQL queries and data pipelines across user attendance, referral, subscription, payment, and messaging workflows using incremental aggregation strategies and query tuning.
- Built end-to-end data pipelines unifying heterogeneous sources (Firestore, Google/Meta Ads, WhatsApp/AiSensy messaging logs, transactional databases), implementing entity matching, and event sequencing across system boundaries.
- Developed automated data models and analytical views powering Looker Studio dashboards, implementing funnel/event processing, cohort retention analysis, referral tracking, customer support metrics, and AI-classifier log monitoring.

Software/AI Engineering Intern | [Hanyaa Auto Technologies \[Experience Letter\]](#)

Hyderabad, India | Jun 2025 – Jul 2025

- Engineered an AI text-to-animated-video narration pipeline for Indian languages (EN, HI, TE) by fine-tuning Dia-TTS (1.6B), optimizing training with dynamic LR scheduling and gradient clipping to eliminate robotic artifacts.
- Architected a long-form audio generation engine with sentence chunking (NLTK), input text normalization, failure-handling retry logic, and seed-locked speaker consistency (IS11 tag) for coherent synthesis.
- Built an interactive Streamlit UI integrating Gemini 2.5 Flash TTS API alongside proprietary media pipelines(Hanyaa's), enabling automated multilingual narration generation.

Projects

DynamoCore [\[Code\]](#) | A Highly Available Key-Value Storage

| Java, RocksDB, Maven, Gossip Protocol, Vector Clock

- Implemented the [Amazon Dynamo paper \(2007\)](#) end-to-end using Core Java and its multithreading features, built a distributed AP key-value store with asynchronous quorum consensus ($N=3, W=2, R=2$) via non-blocking CompletableFuture pipelines, achieving 12 ms p99 write latency under concurrent load.
- Implemented a consistent hashing ring(150 virtual nodes/host, MurmurHash3) with $O(\log N)$ key routing, achieved sub-4% load distribution deviation and bounded node-join/leave data migration to K/N , eliminating full-ring reshuffling on topology changes.
- Sustained 100% Writes during primary replica failures using sloppy quorums, hinted handoffs, and a P2P Gossip failure detector (ALIVE/SUSPECT/DEAD) with automated background recovery replay, zero writes lost during simulated node outages.
- Eliminated the full-dataset reconciliation scans by implementing Merkle Tree anti-entropy with $O(1)$ root-hash validation (6 ms p99) – used immutable Vector Clocks for causal conflict detection, enabling targeted replica repair without global consistency locks.

UrbanEats [\[Code\]](#) | Event-Driven Food Delivery Platform

| React, Node, TypeScript, RabbitMQ, Socket.io, Docker

- Decoupled core domains into 6 autonomous Node.js/TypeScript microservices communicating via HTTP and asynchronous RabbitMQ AMQP message queues, ensuring fault tolerance and zero-downtime service autonomy.
- Built a real-time courier dispatch using MongoDB 2dsphere spatial indexing and \$nearSphere queries to match the nearest available courier within 500 m – streamed live GPS telemetry at 10-second intervals to React/Leaflet clients via Socket.IO room-based routing.
- Automated abandoned cart with MongoDB TTL indexes(15-mins) and secured payment finalization with Razorpay HMAC SHA-256 signature validation – used RabbitMQ to atomically persist confirmed transactions, preventing double-processing on retries.
- Optimized the media pipelines by streaming Multer in-memory buffers as Base64 DataURIs to Cloudinary CDN for zero-disk asset uploads, utilizing native MongoDB drivers to eliminate ODM overhead during bulk KYC verification workflows.

Enterprise RAG Orchestrator [\[Code\]](#) |

Agentic RAG & Text-to-SQL Engine

| FastAPI, LangGraph, Qdrant, Redis, Ragas

- Built a stateful multi-path reasoning engine with LangGraph and PostgreSQL checkpoints – dynamically routes queries across RAG, Text-to-SQL, and Hybrid paths; implemented Corrective RAG (CRAG) web fallbacks and Self-RAG reflection loops to reduce hallucinations across a 95% noise document corpus.
- Engineered a multi-stage retrieval pipeline with Qdrant hybrid search (Dense + Sparse TF-IDF via RRF), HyDE expansion, and Cross-Encoder reranking (Top-20 to Top-5), backed by a 5-tier cryptographic Redis cache.
- Developed an AST-guarded Text-to-SQL engine over 7 PostgreSQL 16 tables deployed on K8s – enforced SELECT-only execution policies and integrated LangGraph interrupt() HITL approval gates to block AI-generated mutation queries before execution.
- Hardened a 9-layer defense architecture across FastAPI endpoints with ML prompt injection scanning (11m-guard), XML spotlighting, bidirectional PII redaction, token budgeting, and Ragas benchmarking.

Skills

- Languages: Java, Python, C, C++, JavaScript (ES6+), TypeScript, SQL, HTML5, CSS3
- Core CS & System Design: Data Structures & Algorithms, Operating Systems, Multithreading, Networking, DBMS, Distributed Systems, Microservices Architecture, High-Level Design, Design Patterns, OOPs, API Design, Data Modelling
- Web & Frameworks: React.js, Next.js, Node.js, Express.js, React Native, FastAPI, Streamlit, Socket.io, Tailwind, REST APIs
- Databases & Infrastructure: PostgreSQL, MySQL, MongoDB, Redis, BigQuery, Firebase, Docker, RabbitMQ, Git, Linux, CI/CD
- AI/ML & GenAI: PyTorch, TensorFlow, LangGraph, RAG, Hugging Face, Transformers, Scikit-learn, XGBoost, NLTK

Certifications

[System Design \(Grokking\)](#) (2026), [System Design Basics](#) (2026), [Advanced SQL Querying](#) (2025), [Algorithms & CP](#) (2025), [Java In Depth](#) (2023), [SQL](#) (2023), [Deep Learning](#) (2023), [Machine Learning](#) (2023), [The React.js Guide](#) (2025), [The React Native Guide](#) (2025)