

# Hitesh Kumar Gupta

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## EDUCATION

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### K. K. College of Engineering & Management, Dhanbad

Expected 2027

B.Tech in Computer Science & Engineering

*Relevant Coursework: Data Structures & Algorithms, Operating Systems, Computer Networks, Databases, Distributed Systems, Computer Organisation, AI & Machine Learning, Discrete Mathematics*

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## EXPERIENCE

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### Indian Institute of Technology Kharagpur

May 2026 – Present

*R&D Intern | Under Dr. Koustav Rudra*

- Accelerated a 100K-call LLM generation workload 10x (24h to under 3h) by migrating from HuggingFace Transformers to vLLM on a shared H100; profiled the job as prefill-bound and tuned KV-cache memory utilization and batch scheduling to eliminate OOM and context-overflow failures.
- Built a reproducible 8-stage data pipeline converting 1,000+ video transcripts into 75K+ QA and 34K multiple-choice items; per-item incremental writes enabled crash recovery and resumption across multi-hour GPU jobs with zero data loss.
- Designed a leakage-safe dataset release using video-level splits, cross-format-disjoint evaluation sets, and an over-select-then-backfill solver that hits exact split-size targets; added embedding-cosine near-duplicate removal and an LLM-as-judge faithfulness filter (Gemma-3-27B on vLLM) that cut the defect rate to under 4%.

### Indian Institute of Technology (IIT) ISM Dhanbad

Feb 2026 – Apr 2026

*R&D Project Intern | Under Dr. Sachin Tripathi*

- Implemented a blockchain-assisted mutual authentication and key agreement scheme for fog-based healthcare infrastructure using Hyperledger Fabric, based on the BAloG protocol architecture.
- Configured a three-layer consortium network (cloud servers, fog nodes, smart meter simulation); benchmarked chaincode transaction throughput and cryptographic overhead using ECC scalar multiplication and hash operations.

### Birsa Institute of Technology, Sindri

June 2025 – July 2025

*Deep Learning Intern | Under Dr. Khustar Ansari*

- Built and deployed production-ready deep learning pipelines for image processing, translating academic research papers into deployable Python software artifacts.
- Led a team of 4 engineers; defined development standards for model training pipelines and cloud deployment workflows, achieved 100% deployment success rate across all systems.

### VaporFi Labs (Remote)

Sep 2022 – Apr 2026

*Software Engineer | Part-Time*

- Built high-throughput event-driven indexers ingesting on-chain data streams in real time into PostgreSQL. Designed and optimised composite SQL indexes to maintain sub-200ms p95 query response times under sustained production load.
- Built REST and GraphQL APIs with Zod schema validation; implemented TanStack Query caching and request deduplication reducing redundant network calls by ~40%; containerised services with Docker and set up CI/CD pipelines for self-hosted infrastructure.
- Led end-to-end development of a high-volume NFT marketplace handling 65k+ assets, ERC721 smart contracts with Merkle Tree allowlists for gas-efficient minting, IPFS metadata storage, and a React/Next.js frontend; improved Google Core Web Vitals from 63 to 95+ via ISR/SSG refactor and selective hydration.

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## PUBLICATIONS

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Gupta, H. K. (2025). **When Better Eyes Lead to Blindness: A Diagnostic Study of the Information Bottleneck in CNN-LSTM Image Captioning Models**. International Journal of Computer Applications. DOI: 10.5120/ijca2025925560

*Cited 3 times across IEEE-published research, IOP Science, and NCIT Journal.*

## TECHNICAL SKILLS

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**Languages:** Python, TypeScript, JavaScript (ES6+), SQL, Bash

**Backend & APIs:** Node.js, GraphQL, REST APIs, WebSockets, Event-Driven Architecture

**Databases:** PostgreSQL, Redis, ETL Pipelines, Query Optimisation, Indexing

**ML & Data:** PyTorch, TensorFlow, Transformers, vLLM, Hugging Face

## ACHIEVEMENTS

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- **Track Coordinator:** Shared task track organised by IIT Kharagpur and IISER Kolkata, at Forum for Information Retrieval Evaluation (FIRE) 2026.
- **First Rank:** Ranked first in the Computer Science & Engineering programme.
- **arXiv Endorsement (cs.CV, cs.LG):** Endorsed by established computer scientists for preprint publication, obtained independently without institutional affiliation.
- **Hindustan Talent Honour 2023:** Recognised for outstanding academic excellence.