



ABHINAV GUPTA



ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	M.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	8.33
2021	B.Tech	IIT Guwahati	8.48
2016	HPBOSE	St. Stephens School Chamba (H.P.)	90%
2014	CBSE	D.A.V. Public School Chamba (H.P.)	10.0

SCHOLASTIC ACHIEVEMENTS

Department Rank 5: Current rank in MTech CSE, IITD | **Samsung Fellowship 2021:** Top 10% Bachelor Thesis in IITG
JEE Advanced 2017: Top 3% among 2.1L candidates | **State Board Merit 2016:** Awarded laptop for Science stream merit

WORK EXPERIENCE

American Express | *Global Data Platform & Prospect Intelligence* Gurgaon | Dec'24 - Jun'25
- Engineered **scalable ingestion pipelines** for GPD platform, orchestrating workflows across **5.6M+** records.
- Implemented **fuzzy matching** algorithms to map multi-source vendor data streams to internal CRM databases.
- Built automated **deduplication services**, accelerating downstream batch compute throughput by **~40%**.

Fractal.ai | *Portfolio Optimization & Performance Analytics* Bengaluru | Aug'21 - Dec'24
- Built distributed **PySpark** systems processing 10M+ records, reducing job latency by **75%** via custom partitioning.
- Engineered a SKU recommendation engine integrating **KNN clustering** & **MINLP** optimization for a Fortune 500 client.
- Architected **ETL batch pipelines** & automated portfolio refresh services, eliminating manual operational lag.

PROJECTS

Memory-Constrained Relational Query Engine | Prof. Kaustubh Beedkar Jan'26 - Apr'26
- Engineered an out-of-core TPC-H relational engine under a **64 MB memory ceiling** using an adaptive $O(1)$ **LRU buffer pool**.
- Implemented Volcano iterator with **projection pushdown** & **hybrid joins** via pipe-based I/O to minimize disk overhead.
- Streamed **multi-gigabyte** query workloads with **zero memory spills**, executing nested relational operators efficiently.

Distributed E-Commerce Platform | Scaler Feb'25 - Apr'25
- Architected event-driven microservices for order, inventory & payment modules via **FastAPI, PostgreSQL, Redis & Kafka**.
- Implemented **Saga pattern** for distributed transactions with idempotent consumers & automated retries for consistency.
- Reduced p95 latency to **<50ms** at ~2,000 req/s using Redis caching, multi-column DB indexing & async event loops.

Systems Programming: Shell, Compiler & Virtual Machine | Prof. Kolin Paul Dec'25 - Mar'26
- Developed a POSIX-compliant C++ shell supporting multi-stage pipelines, process isolation, signal handling & job control.
- Built a **Flex/Bison compiler** translating C-like source code into ASTs and custom bytecode representation.
- Designed a 64-bit stack virtual machine featuring **mark-&sweep garbage collection** for dynamic memory management.

AI Game Agent for 'Rivers & Stones' | Prof. Mausam Sept'25 - Nov'25
- Built an adversarial agent using **Iterative Deepening Minimax** and α - β pruning under strict move time budgets.
- Integrated Zobrist hashing with Transposition Tables & **move-ordering heuristics** to maximize tree pruning depth.
- Designed domain-specific heuristic evaluation functions combining positional mobility and **Manhattan distance** metrics.

IIT DELHI THESIS

Aphasia-LLM: Multimodal Speech-Language Modeling & Clinical Severity Estimation May'26 - Present
Supervisor: Prof. Rahul Garg, Prof. N M Anoop Krishnan
- Benchmarked **Audio LLMs, ASR & phonemic models** on AphasiaBank to capture pathological speech features.
- Trained regression models with **nested CV** to predict WAB clinical scores, evaluated using **SHAP & CI** analysis.
- Profiled real-time **inference latency** & **compute telemetry** to assess model robustness for clinical deployment.

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, Java | **Libs:** FastAPI, PySpark, NumPy, Pandas, PyTorch | [LeetCode](#) (500+ Problems)
Tools: Linux, Redis, Kafka, Azure, Databricks | **Fundamentals:** DSA, OOP, System Design, DBMS, OS | [Github](#) (other projects)

TEACHING ASSISTANTSHIP

Data Structure and Algorithms (COL106) | System Concepts (COL7001): Assisted with lab tutorials, assignments & grading.

EXTRA CURRICULAR ACTIVITIES

- Active in **LeetCode/Codeforces** contests, participated in CodeAsylums bootcamp and built multiple hackathon projects.
- **Event Organiser, TEDx IIT Guwahati 2019:** Managed guest speakers, handled stage introductions & event logistics.
- Cultivated interviewing, writing & editorial skills curating articles for *The Excited State*, IITG departmental magazine.



ABHINAV GUPTA



IIT COURSE

Degree	Institute	CGPA	Dept. Rank
M.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	8.33	5

COURSES DONE

Cornerstone Project, Introduction To Data Management, Introduction To Computer Vision, Information Visualization, Teaching Practicum In Computer Science And Engineering, Systems Concepts, Mathematical Foundations Of Computing, Introduction To Artificial Intelligence, Teaching Practicum In Computer Science And Engineering