

Mrigankashekhar Shandilya

Final Year Undergraduate, IIT Gandhinagar

B.Tech in Computer Science and Engineering, with Honours



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Education

Degree	Institute	CPI/%	Year
Bachelor of Technology (B.Tech)	IIT Gandhinagar	9.03/10	2022 - Present
Indian School Certificate (ISC)	City Montessori School, Lucknow	98%	2022
Indian Certificate of Secondary Education (ICSE)	St. Francis' College, Lucknow	97%	2020

Experience

Tower Research Capital | Finance & Treasury Tech, Post Trade | Software Engineering Intern (Aug'25 - Dec'25)

- Designed, implemented, and productionized an end-to-end concurrent Journal Posting Workflow to maintain consistent ledger book records using Java (Spring), Postgresql, and Typescript (React) taking measures to handle race conditions.
- Implemented a common Java library for securely accessing the Journaling APIs through the codebases of multiple teams.

Google | Git Solutions, Core Engineering | Software Engineering Intern

(May'25 - Aug'25)

- Developed and deployed an AI-assisted feature for Google's CI/CD platform with contextual awareness through a Retrieval Augmented Generation (RAG) system, using Java (Spring), TypeScript (Lit), and Vertex AI impacting over 17000 users.
- Drove end-to-end feature delivery, including microservice creation, CI/CD pipeline setup, collaboration with AI, Security, and UX teams, and gathering developer feedback for feature validation and accuracy to ensure successful launch.

IIT Kanpur | Advisor: Prof. Surender Baswana | Student Research Associate

(May'24 - Jul'24)

- Attempted to solve the problem of maintaining decremental s-t max-flow over edge deletions in an unweighted and directed network in amortized time $\mathcal{O}(n)$ per edge update by exploiting properties of the structure of s-t mincuts.
- Transitioned to finding the vital edges of a weighted undirected graph in less than $\mathcal{O}(n)$ maxflow-computations.
- Received the "Tapas Mishra Memorial Chair Fellowship" at IIT Kanpur to fund the expenses of the internship.

Research Projects

Efficient Batch Updates in Interval Scheduling (in $\mathcal{O}(f \log n)$ time) | Advisor: Prof. Manoj Gupta [🔗](#) (May'23 - Nov'23)

- Extended the batch-updates algorithm to a fully dynamic setting with an amortized update time of $\mathcal{O}(\sqrt{n} \log n)$.
- Developed an incremental algorithm with worst-case update time $\mathcal{O}(\log n)$ using existing research and previous work.

Improved Partitioned Learned Bloom Filters | Advisor: Prof. Anirban Dasgupta [🔗](#)

(Jan'24 - May'24)

- Optimized the computation of optimal partition thresholds from $\mathcal{O}(Nk \log N)$ [current state-of-the-art] to $\mathcal{O}(Nk)$.
- Designed and implemented TurboPLBF to test efficacy on datasets like Malicious URLs and EMBER against PLBFs.

Other Projects

Compiler for self-designed language | Advisor: Prof. Balagopal Komarath [🔗](#)

(Jan'25 - Apr'25)

- Designed a custom low-level language with strict-typing and implemented a compiler in C++ for it up to type-checking.
- Co-developed a compiler in Python for an untyped version of the language, along with a stack-based VM in C.

RISC-V Emulator | Advisor: Prof. Sameer Kulkarni [🔗](#)

(Sep'24 - Nov'24)

- Co-developed a modular RISC-V emulator in C supporting multiple RISC-V ISAs validated by official RISC-V tests.
- Implemented and debugged UART and virtual I/O, while also assisting in the design of the virtual memory system.

Algorithm Design for Large-scale Course Allocation for IIT Gandhinagar [🔗](#)

(Jan'24)

- Designed and implemented an algorithm in Python using Numpy and Pandas, inspired by the Hospital Resident Matching Algorithm, for fair allocation of courses to over 1000 students based on their preferences and needs.

Achievements

- Secured AIR 4 and global rank 105 at Asia Pacific Informatics Olympiad 2022 (among 35 participating nations).
- Qualified for IOITC 2021 by securing a rank among the top 42 students in the INOI 2021, and ranked 18 at the camp.
- Received the Silver Medal in Indian National Olympiad in Informatics (INOI) 2022 by securing rank 21 in India.
- Secured a position among the top 1% teams in ICPC 2023 Regionals by securing rank 44 in the Kanpur Regionals round and rank 54 in the Chennai Regionals round (from among 3368 participating teams in the preliminary round).
- Received Honorable Mention in ICPC 2022 Regionals, Amritapuri by securing the 87th rank among 1212 teams.
- Secured global rank 8 in CodeChef Starters 157 (Div. 1); Indian Junior rank 3 & Scholarship in Sep '21 CodeChef Lunchtime (Div. 2); Ratings: Codeforces (2017, Candidate Master), CodeChef (2099, 5*)

Positions of Responsibility

Club Secretary | Competitive Programming and Algorithms Club

(Aug'23 - Jul'24)

- Mentored and guided students (3000+), through various events and workshops while managing a team of problem-setters.
- Spearheaded IIT Gandhinagar's inclusion in the first ICPC camp, collaborating with 13 top Indian colleges.

Skills and Courses

*excellent performance - A+ grade [11/10]

- Programming Languages/Tools:** C++, Python, Java, C, JavaScript, Typescript, Spring, Lit, NumPy, Pandas, Bash, Git
- Relevant Courses:** Computer Networks, Compilers, Deep Learning, Operating Systems*, Theoretical Foundations of ML, Computer Organization & Architecture, Advanced Algorithms, Intro to Data Science, Complexity Theory, Data Structures and Algorithms, Theory of Computation, Discrete Math, Probability Statistics & Data Visualization, Intro to Computing*