

# Sachin

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## Education

Year	Degree/Board	Institute	GPA/Marks(%)
2019-2023	B.Tech in Computer Science & Engineering	Indian Institute of Technology, Delhi	9.407
2019	Class XII, CBSE	Star Public School	97.40%
2017	Class X, CBSE	Lords International School	10

## Work Experience

- Mastercard Gurugram, AI Intern:** *Entity driven Representation learning* Jun, 2022 - July, 2022
- Designed a **scalable** Entity based **feature representation** of **transactional** data using **LSTM**
  - Utilized **four party model** of mastercard to design entities and get transaction level and card level **embeddings**
  - Used **hierarchical softmax** for extreme class classification, **gross domestic value** and **TPP** problem for testing
  - Proposed representation is **generalizable** & can be used on any downstream problem. **Awarded PPO for my work**

## Scholarship Achievements

- Department Change:** One of **13** students in IITD to secure discipline change to CSE on **merit** basis 2020
- Outstanding Grade:** One of **29** students in IITD to score 10 CGPA in every course in first semester 2019
- IITD Semester Merit Award:** Conferred for ranking amongst **top 7%** students in first sem IITD 2019
- JEE Advanced:** Secured **All India Rank 168**(OB) among 0.22 million candidates 2019
- JEE Mains:** Secured **All India Rank 190**(OB) among 1.15 million candidates 2019
- Olympiads:** School **Gold Medalist** & 2nd level selection in SOF Science and Mathematics Olympiad 2017

## Projects

- Driver Profiling** | *Prof. Rijurekha Sen:* Dec, 2021 - Apr, 2022
- Detected rash driving on Delhi buses by profiling driver behavior using supervised learning on unlabelled data
  - Simulated the GPS data on Unity in real-time to visualize data and performed anomaly detection of faulty sensors
  - Developed heuristics to label the ground truth and used labeled data to perform classification using random forest

- Shell based Operating System** | *Prof. Sorav Bansal:* Feb, 2022 - Apr, 2022
- Developed a shell-based kernel from scratch that takes input from I/O devices and perform basic math operations
  - Implemented Coroutines, Fibres, Non-Preemptive and Preemptive scheduling and multi-core functionality

- Template Search in image** | *Prof. Subodh Kumar:* Mar, 2022 - Apr, 2022
- Implemented an algorithm to determine the position of potentially rotated query image on input image concurrently
  - Used CUDA for parallel computation, bilinear interpolation to compute rotated coordinates, and RMSD for error

- Restaurant dashboard** | *Prof. Maya Ramanath:* Feb, 2022 - Mar, 2022
- A web-based dashboard for restaurants that allows users to log in with different levels and query or edit data
  - Developed front end using HTML and CSS, back-end using flask and PSQl to support highly customizable queries

- SML Compiler** | *Prof. S.Arun Kumar:* Mar, 2021 - May, 2021
- Developed a compiler and evaluator for toy language of boolean algebra and integer arithmetic, using LR(0) parser
  - Language supports type checking, variable declaration, lambda calculus, recursion, and functional programming

- Traffic Density Estimation** | *Prof. Rijurekha Sen:* Feb, 2021 - Mar, 2021
- Computed queue and dynamic traffic density on a given road by finding difference in frames using OpenCV in C++
  - Used optimizations like background subtraction, changing homography, parallel computation using pthreads
  - Reduced computation time on a benchmark video by a maximum of 58.8% (0.5% RMS error) and by 25%(no error)

- MIPS Simulator** | *Prof. Preeti Ranjan Panda:* Feb, 2021 - May, 2021
- Simulated single cycle multi-core processor that interprets and then executes multiple MIPS programs parallelly
  - Used optimizations like background subtraction, changing homography, parallel computation using pthreads
  - Implemented non-blocking DRAM timing model, 1st level cache and instruction reordering reducing CPI by 50%

## Technical Skills

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**Languages:** C/C++, Python, Java, SQL (Postgres), SML/NJ, Rust

Familiar: MIPS(Assembly), VHDL, HTML, CSS, JavaScript, C#, Prolog, Bash

**Libraries:** CUDA, MPI, OpenMP, OpenCV, Pytorch, TensorFlow, Sklearn, Pandas, Matplotlib, NumPy, SDL, Yacc, Lex

**Software & Tools:** Unity, Git, LaTeX, Linux, Vivado, QtSpim, Blender, AutoDesk Inventor

## Relevant Courses

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- **Computer Science:** Virtualization & Cloud Comput, Natural Language Processing, Operating Systems, Parallel & Distributed Programming, Database Management System, Theory Of Computation, Computer Networks, Principles Of Artificial Intelligence, Analysis & Design Of Algorithms, Data Structures And Algorithms, Computer Architecture, Programming Languages, Design Practices, Discrete Mathematical Structur, Mini Project, Btech Project, Digital Logic & System Design
- **Matematics & Other:** Probability and Stochastic Processes, Signals and Systems, Linear Algebra & Application, Algebra, Introduction to Calculus, Fundamentals Of Language Sciences, Introduction to Electrical Engineering

## Position of Responsibility

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**Executive, DevClub:**

May, 2022 - Nov, 2022

- Organised 3 days long **GameJam** event in **Tryst 2022** as a part of Game Development Club IITD
- Helped in the smooth working of **game-dev** part of the club and developed multiple **PC games** using **Unity**

**Student Mentor, BSW:**

July, 2021 - May, 2022

- Counseled 5 freshers to acclimatize them with institute activities, ensuring smooth transition into IIT Delhi