AMAN KUMAR

ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	B.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	7.433
2019	CBSE (XII)	British English School, Gaya	91.6%
2017	CBSE (X)	Vivekanand Public School, Warisaliganj	10

SCHOLASTIC ACHIEVEMENTS

- **JEE ADVANCED 2019:** Secured All India Rank 53 (OB) amongst more than 1,61,000 selected candidates
- **JEE MAIN 2019:** Among top 0.17% of the 1.3 million applicants in JEE Main 2019
- **MCM Scholarship Awardee:** Selected for Merit Cum Means Scholarship from the batch of 2019

INTERNSHIPS

- **Huawei Technologies India Pvt Ltd** | *Software Developer Intern* [Jun'22 - Jul'22]
  - Built a Constrained Application Protocol(**CoAP**) library for OpenHarmony in Extended TypeScript for IoT devices
  - Ported various dependencies such as **LRU-cache** to avoid DDOS problems, and **BufferList** to Extended TypeScript
  - Designed product roadmap by thoroughly analyzing various CoAP libraries to include features like Async messaging

PROJECTS

- **Automatic JavaScript Parallelism For Web Computation** | *Prof. Smruti R. Sarangi* [Aug'22 - Present]
  - Working on an optimized pipeline to automatically parallelize JavaScript on legacy webpages enabling **unmodified** browsers to leverage multiple CPU cores, drastically improving efficiency on commodity smartphones.
  - Servers will perform **concolic execution** of code to identify parallelism possibilities based on potential state accesses.
  - The client will run the rewritten code using a **dynamic scheduler** to offload tasks to worker threads.
- **Realtime Traffic Density Estimation** | *Prof. Rijurekha Sen* [Feb'21 - Mar'21]
  - Estimation of dynamic and static traffic density from video taken by camera on the road using **OpenCV** library in **C++**
  - Used **Homography** for perspective correction, **Background Subtraction**, and **Optical Flow** for density estimation
  - Analyzed runtime trade-offs in software design by sub-sampling of frames, resolution reduction and multi-threading
- **Multiplayer 2D Maze Game** | *Prof. Rijurekha Sen* [Apr'21 - May'21]
  - Created a multiplayer 2D PvPvE top-down shooter game with random bot spawn using **SDL2.0** library in **C++**
  - Implemented a **Random Maze Generation** Algorithm to generate a different map for every run of the game
  - Implemented an AI for bot movement using a Path Finding Algorithm based on Breadth First Search
- **Handwritten Devanagri Character Classification** | *Prof. Rahul Garg* [Nov'21 - Dec'21]
  - Implemented a **Neural Network** to categorize handwritten Devanagari characters with **94.2%** accuracy
  - Improved the accuracy to **97.3%** by implementing a Convolutional Neural Network using **PyTorch**
- **AI Pacman Agent** | *Prof. Rohan Paul* [Sep'21 - Oct'21]
  - Implemented a Pacman-playing agent by modelling the decision-making task as an Adversarial Search Problem
  - Implemented Adversarial Search Heuristics such as the **Minimax**, **Alpha-Beta Pruning** and **Expectimax** algorithms
- **MIPS Interpreter And Simulator** | *Prof. Preeti Ranjan Panda* [Feb'21 - May'21]
  - Implemented a MIPS interpreter in **C++** using the DRAM model for memory and simulating elapsed clock cycles
  - Created a Memory Resource Manager which uses several heuristics to maximize throughput and reduce idle time
- **Chat Application** | *Prof. Abhijnan Chakraborty* [Sep'21 - Oct'21]
  - Implemented chat application leveraging an **HTTP-like** protocol using multi-threaded socket programming in **Python**
  - Supports multiple clients, login, logout, unicast, broadcast operations and plain text messages of arbitrary length
- **Dynamic Memory Allocator** | *Prof. Rahul Garg* [Nov'20 - Dec'20]
  - Implemented a Dynamic Memory Allocator with functions for Allocation, Deallocation, and Defragmenting in **Java**
  - Implemented First Fit Algorithm using Doubly-linked list and Best Fit Algorithm using Binary Search tree and AVL tree

TECHNICAL SKILLS

- **Languages:** C, C++, Java, TypeScript, Python, SML, Prolog, R, Octave, VHDL, MIPS, Bash, LATEX
- **Tools and Libraries:** STL, SciPy, OpenMP, NumPy, Pandas, Sklearn, SDL2.0, OpenCV, ML-Lex, ML-Yacc, PyTorch, MPI
- **Web Development:** HTML, CSS, JavaScript, ReactJS, jQuery, NodeJS
- **Miscellaneous:** Git, Jupyter Notebook, Autodesk inventor, Android Studio, OpenHarmony

EXTRA CURRICULAR ACTIVITIES

- Winter Collection Drive: Collected books, clothes, toys, etc. for donation to various NGOs
- Participated in Blanket Distribution Drive of NSS IITD to distribute blankets among needy people suffering from cold

Disclaimer: All the information on this page is entered by student.

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IIT COURSE

Degree	Institute	CGPA
B.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	7.433

QUALIFYING EXAM

- **Joint Entrance Examination (JEE) Advanced Rank:** 53 (OB)

COURSES DONE

Intro. To Computer Science, Calculus, Electromagnetic Waves&qua.mec., Linear Algebra & Diffe. Equa., Computer Architecture, Design Practices, Signals And Systems, Probability & Stochastic Pro., Principles Of Elect. Materials, Data Structures And Algorithms, Digital Logic & System Design, Discrete Mathematical Structur, Introduction To Comp.sc. & Eng, Computer Networks, Principles Of Artificial Int., Analysis & Design Of Algorithms, Linear Algebra & Applications, Intro To Automata & Th. Of Co., Operating Systems, Digital Logic & System Design