



SHIVAM SINGH



ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	B.Tech in Computer Science & Engineering	Indian Institute of Technology, Delhi	7.088
2020	CBSE	Red Rose Public School, Lucknow.	95.6%
2018	CBSE	Red Rose Public School, Lucknow	96.2%

SCHOLASTIC ACHIEVEMENTS

- Active competitive programmer with **5-star** badge and rating more than **2000** at **CodeChef** (*username shivam_062003*).
- Secured **99.24 percentile** among 1.2 million candidates in **Joint Entrance Exam (JEE) Mains** 2020 examination.
- Secured a position within the **top 1%** among 250 thousand candidates in **Joint Entrance Exam (JEE) Adv.** 2020.
- Cleared **stage 1** and secured a position in **top 10%** merit list of **National Mathematics Talent Contest** 2019.

PROJECTS

- **Multi-Player Game** | *Prof. Rijurekha Sen* (Mar' 2022 - May' 2022)
 - Developed a 2-D multi-player competitive maze game using **Socket Programming** & **SDL library** in C++ language.
 - Applied the **graph exploring algorithm** and the **shortest path algorithm** for designing several features of the game.
 - Created and used **Binary Search Tree** data structure for locating and recognizing different objects in the maze.
 - 2-D graphics and sound effects were added to the game using **SDL2-Image**, **SDL2-TTF**, and **SDL2-Mixer** libraries.
- **Multi-Cycle Processor** | *Prof. Anshul Kumar* (Feb' 2022 - Apr' 2022)
 - Designed and simulated a multicycle processor supporting the **ARM 32-bit architecture** using VHDL language.
 - This processor supports the **Data Processing**, **Data transfer**, **Branching**, and the **Software Interrupt** instructions.
 - Hardware Design includes an ALU, a Register File, a 32-bit shifter/rotator, a memory, a multiplier, & a flag controller.
 - A **9-States FSM** (Finite State Machine) was designed and used as the gluing logic & the controller for the processor.
- **DSCoin** | *Prof. Amitabha Baggchi* (Oct' 2021 - Nov' 2021)
 - Developed a **cryptocurrency model** working on **blockchain technology** using the Merkle tree and LinkedList DS.
 - Used **LinkedList** DS for implementation of blockchain, implemented & used **Merkle Tree** to encrypt blockchain data.
 - The model supports features such as customer **ID generation**, transaction **KEY generation**, & basic **crypto mining**.
 - Applied **SHA-256** cryptographic hash function in Merkle tree for efficient and secure encryption of the blockchain data.
- **Audio Processing Library** | *Prof. Rijurekha Sen* (Feb' 2021 - Mar' 2021)
 - Implemented **Deep Neural Network** inference for classifying across 12 audio keywords with up to **90%** accuracy.
 - Used **MKL** and **Openblas** libraries for creating an **FC layer** that computes inner products of matrices very efficiently.
 - Applied efficient implementations of **Relu** and **Softmax** functions for non-linear activations and conversions respectively.
- **Student Record Management System** (Sept' 2021 - Sept' 2021)
 - Used **LinkedList** DS to store the records of randomly grouped students with each node dedicated to only one student.
 - Implemented **Merkle Tree** and used the Merkle tree for encrypting the records stored in the nodes of the linked lists.
 - For efficient and secured encryption of the LinkedList data in Merkle tree, applied **SHA-256** cryptographic hash function.
- **Image Encrypter/Decrypter** | *Prof. Abhishek Dixit* (Mar' 2022, Apr' 2022)
 - Created pixels modifier using the **Fast Fourier transforms** and **Hashing**, used for encrypting & decrypting images.
 - The **Hash function** applied takes a password from the user to generate a **KEY** for encryption and modifies the pixels.
 - Decryption is done by reverting the modifications in the pixels which are carried out by an **Inverse Hash function**.
- **Restaurant Map** | *Prof. Venkata Koppula* (Sept' 2021 - Oct' 2021)
 - Implemented and used **2-D tree** for storing coordinates of the restaurant using x and y coordinates of the points as keys in a strictly alternating sequence.
 - For finding restaurants in a rectangular range around a given coordinate a **2-D range query algorithm** was used.

TECHNICAL SKILLS

- **Programming Languages & Tools:** C++, C, Java, Python, Standard ML, Prolog, VHDL, ARM Assembly, GTK_wave.
- **Libraries, Software & Web-Dev:** Linux, HTML, CSS, AutoDesk Inventor, SDL-2, SDL-TTF, SDL-Mixer, Latex, Aurdino.

EXTRA CURRICULAR ACTIVITIES

- **Sports:**
 - Team member of Karakoram House Cricket team and IIT Delhi Cricket Team & represented Karakoram House in Inter-Hostel Weight-Lifting competitions.



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IIT COURSE

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B.Tech in Computer Science & Engineering	Indian Institute of Technology, Delhi	7.088

COURSES DONE

Engineering Mechanics, Intro. To Electrical Engg., Linear Algebra & Diffe. Equa., Calculus, Electromagnetic Waves & Qua.mec., Intro. To Computer Science, Probability & Stochastic Pro., Discrete Mathematical Structur, Digital Logic & System Design, Introduction To Comp.sc. & Eng, Data Structures And Algorithms, Principles Of Elect. Materials, Renewable Energy And Environment, Signals And Systems, Macro Economics

POSITIONS OF RESPONSIBILITY

- House Working Committee Member, Karakoram, BHM