



Kartik Sharma
Bachelor of Technology
in Computer Science and Engineering
Indian Institute Of Technology, Delhi

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Examination	Institute	CGPA/%	Year
Graduation	Indian Institute of Technology, Delhi	9.591	2024
Intermediate	CBSE, Bhavan Vidyalaya Panchkula	98.8 %	2020
Matriculation	CBSE, Spring Dale Sr. School Amritsar	95.4 %	2018

Scholastic Achievements

- Got **IIT DELHI top 7 percentile Merit scholarship** consistently in both first and second semester '21
- Secured **All India Rank 87 (JEE Advanced/250,000 candidates)** and **42 (JEE Main/1 million candidates)** '20
- Amongst national **top 10** in Indian National Olympiad in Astronomy **twice** and invited to attend OCS camp of INAO at **HBCSE, Mumbai** '19, '20
- **Top 1 % All India** in National Standard Examinations (NSEP, NSEC, NSEA) i.e. **Physics, Chemistry and Astronomy** '20
- Awarded the **National Fellowship in Basic Sciences (KVPY)** by the **Indian Govt.** and **IISc Bangalore** by securing **All India Rank 226** '19
- Conferred the **Ministry of Education's National Talent Search Scholarship** (800 recipients/1 million candidates) '18
- Secured **All India Rank 7** in **National Creativity Olympiad** conducted in multiple stages across India '15

Course Projects

Automatic Speech Recognition (ASR)

*Spring '22

Guide: Prof. Rijurekha Sen

- Implemented a **deep neural network (DNN)** inference for classifying across 12 different audio keyword
- The **API** creates a feature vector from a 1 second audio clip and returns **top 3 keywords** with highest **softmax probability**

Electrocardiogram signal analysis

*Spring '22

Guide: Dr. Abhishek Dixit

- **Signal analysis** of quasi periodic voltage signal of heart to determine heart rate and **detect abnormalities**
- Processed data from heart and classified it into different classes and hence determine if the **heart beat is normal or not**

Built Own Cryptocurrency (DScoin)

Fall '21

Guide: Prof. Amitabh Bagchi, Prof Venkata K. Koppula

- Extensively researched about **Merkle Trees, Collision resistant functions(CRF), Digital signatures and encryption**
- Built a **digital payment system** that doesn't rely on a third-party bank for its functioning
- Assigned roles of buyer, seller and created a **moderator for mining** the transaction blocks and updating blockchain
- Ensured **authenticity** of every transaction and checking for counterfeit coins, double spending and malicious moderators

Find Restaurants In Neighbourhood

Fall '21

Guide: Prof. Amitabh Bagchi, Prof Venkata K. Koppula

- Efficiently built a **KD Tree data structure** for a set of restaurants having their **co-ordinates and other features** (prices etc.) as data-set for faster implementations of operations
- Implemented **Query function** to locate restaurants based on **input feature ranges** with reduced time complexity

Pattern Recognizer and Counters

Fall '21

Guide: Prof. Vireshwar Kumar, Prof. M. Balakrishnan

- **Designed pattern recognizing state machine** for symbols and patterns and studied the various **abstraction levels** of the design
- **Simulated** the design in a **hardware description language (VHDL)** and used **counters** to access memory locations in a sequence

Academic Blockchain Document (ABCD)

Fall '21

Guide: Prof. Amitabh Bagchi, Prof Venkata K. Koppula

- Used **Blockchain technology** and concepts of cryptography (CRF) to **record data certificates** in a **secure linked chain manner**
- **ABCD** allows **transparent, tamper proof and paperless usage** of these certificates
- Efficiently implemented operations like **Update Document, Build, Proof Of Score, Insert Block** to support the blockchain

Smart Vending Cart Project

Summer '21

Guide: Prof. Subir Kumar Saha

- **Analysed** the **features and technology** of the existing vending carts and then **provided solutions** to the problems
- **Designed** a smart vending cart by giving **technological, scientific and economically feasible solutions**. Also offered funds from **RuTAG IITD**, to implement the design

Automatic Quiz System

Spring '21

Guide: Prof. Rahul Narain, Prof Huzur Saran

- Using concepts of **object oriented programming (OOP)**, coded an automatic quizzing system which allows the users to **attempt a quiz** of a given course
- Coded **supplementary functions** to calculate **score for an attempt** and **average and maximum scores** in a quiz

* indicates ongoing course projects

Technical Skills

Programming Languages	Python, C, C++, Java, SML-NJ, Prolog
Other Software	Git, L ^A T _E X, MATLAB, ARMSim#, VHDL, Microsoft Office

Key Courses Taken

Computer Science	Data Structures and Algorithms, Digital Logic and System Design, Computer Architecture*, Signals and Systems*, Programming Languages*, Design Practices in Computer Science
Mathematics	Probability and Stochastic Processes, Discrete Mathematical Structures, Differential Calculus, Integral Calculus, Ordinary Differential Equations, Partial Differential Equations, Linear Algebra
Miscellaneous	Principles of Electronic Materials, EM waves and Quantum Mechanics, Engineering Mechanics, Product Designing and Manufacturing, Environmental Science, Language Science etc.

**in progress*

Positions of Responsibilities

- **Exective** at Physics and Astronomy Club, IITD; worked in **satellite design** and **observational astronomy** division
- **Mentored** undergraduate freshers for the course introduction to **computer science** as an **Academic Mentor**
- Led Karakoram hostel **Table Tennis team** at General Championship (GC) as **Vice Captain** of the team
- Organized **Literary Art** and **Math** events and **mentored young students** as a part of the **student council body** at high school

Co-Curriculars & other Achievments

- Designed the algorithm for a variant of **quantum tic-tac-toe** and studied about deterministic winning strategies.
- Crowned **Mr. Rendezvous** at Rendezvous'21, the **largest cultural fest** in North-India with entries from all over country
- **2nd runner up** at Punjab state **chess tournament** and participated at **National level** chess tournament held at Nagpur, India
- Volunteered to **teach under-privileged students** as a part of **VIDYA teaching program** as a part of NSS.
- Nature and Astronomy photography enthusiast, **Timeline society IITD** for participating in photography competitions.