Chinmay Mittal

(+91)9811769517
chinmay.mittal.iitd@gmail.com

Sophomore
Department of Computer Science and Engineering
Indian Institute Of Technology, Delhi

Education

2020–2024 **B.Tech. Department of Computer Science and Engineering**, *Indian Institute of Technology, Delhi*, CGPA - 9.74/10

2019-2020 **CBSE, Class 12th**, *Delhi Public School, Vasant Kunj*, Score - 98.4%

2017-2018 **CBSE, Class 10th**, *Delhi Public School, Vasant Kunj*, Score - 98%

Scholastic Achievements

2021 Among the top 40 to be awarded the **Reliance Foundation Scholarship** in AI and CS

2021 **Semester Merit Award**, IIT Delhi for being among the top 7% and scoring a perfect SGPA

2021 **ACM-ICPC Regionalist**, Amritapuri site

2020 Secured **All India Rank 31** in JEE Advance among **220 thousand students**

2020 Secured **All India Rank 139** in JEE (Joint Entrance Exam) Main among **1.4 million** students

2020 Awarded KVPY Fellowship-2020 secured **AIR 8** by **Indian Institute of Science, Bangalore**

2020 Awarded **Gold Medal** for seven consecutive years of academic excellence by Delhi Public School, Vasant Kunj

2019 Among the **top 1%** Qualified for the Indian National Chemistry and Physics Olympiads

2018 Among the **top 1000** students to be awarded the **National Talent Search Scholarship**

2017 Awarded the **JSTSE scholarship** by the Science Branch of the Directorate of Education in Delhi

Experience

December 2021 - Present **Project Intern**, *Fractal Analytics*

◇ Working on dynamic demand forecasting and time series forecasting to improve category level performances
◇ Working with econometric models like ARIMA and FB Prophet, Deep Learning based models like LSTMs, and ML models like XGBoost and regression techniques

Projects and Assignments

Oct 2021 - Present **Sudoku solver using Computer Vision and Deep Learning**

◇ Used OpenCV, to process the Sudoku image, converting it to grey scale and then using Gaussian Blur and Adaptive thresh-holding
◇ Used OpenCV, to perform contour detection, to find the sudoku board in the image, then extracted each cell from the board
◇ Implemented a CNN based on the LeNet-5 architecture, using Keras and Tensorflow API's, to detect digits which was used to extract the board out of the image
◇ Implemented backtracking and recursion in python to solve the board and OpenCV, to overlay the solution back to the input image

Oct 2021 - Present **DS-Coin a cryptocurrency**, *Prof. Venkata Koppula, IIT Delhi*

◇ Implemented Authenticated Data Structures (lists, sets) for building a cryptocurrency in Java
◇ Implemented a balanced Merkle tree using AVL-Tree like rotations for storing records efficiently with fast updates and proof of membership
◇ Used Authenticated Data Structures to implement different parts of a cryptocurrency such as mining of transaction blocks, checking for double spending, providing payment proofs and dealing with malicious miners

Sept 2021 - Oct 2021 **Deep Neural Network module for Image Classification**, *DeepLearning.ai*

◇ Implemented a generic module for a deep neural network and in the process implemented forward propagation, backward propagation, gradient descent algorithms. The module allows tuning of number of layers, various activation functions, initialization techniques.
◇ Trained the model on data set of cat images achieving 80% test accuracy
◇ Implemented several optimization algorithms for the module such as Adam's algorithm, gradient descent with momentum, decaying learning rates, mini-batch gradient descent, regularization and Xavier initialization

Oct 2021 **k-d Trees**, *Prof. Venkata Koppula, IIT Delhi*
◇ Implemented k-d Trees in Java to store 2D points in space for efficiently answering 2-D Range queries (number of points in a rectangle) and finding the nearest neighbour (closest point to a query point) using depth-first search

December 2021 **Trigger Word Detector**, *DeepLearning.ai*
◇ Implemented a trigger word detector (similar to OK Google) using RNNs
◇ Created a data set containing speech data, by overlaying positive and negative examples to background noise and converting to speech spectrograms for the input, utilized 1D Convolution layers , 2 GRU layers and a dense layer along with dropout regularization and batch normalization for the model in keras

November 2021 **Car Detection with the YOLO algorithm**, *DeepLearning.ai*
◇ Implemented the different components of the YOLO (you only look once) object detection algorithm such as non-max suppression, anchor boxes, IoU (intersection over union) using NumPy and TensorFlow
◇ Used a pre-trained CNN to produce bounding boxes for different type of objects in self-driving car images cleaned the output of the CNN restoring the relevant objects detected

November 2021 - Present **Emojify**
◇ Built a sequence model to suggest emojis for text sentences
◇ Implemented LSTM's in Keras and utilized pre-trained GloVe word embeddings as part of the embedding layer in keras to predict emojis with a test accuracy of 78%

August 2021 - October 2021 **Enola**
◇ Part of a IIT Delhi ed-tech startup building a learning app for school students
◇ Designed and implemented the back-end of the app, creating REST API's using ExpressJS, NodeJS, MongoDB, JWT and AWS S3 Buckets

April 2021 - Present **Competitive Programming Library**
◇ Implemented a library of several efficient data structures and optimized algorithms for competitive programming contests
◇ Implemented Graph Algorithms, String Algorithms, binary lifting, disjoint set unions, sparse tables, tries, segment trees, binary exponentiation, sieve of Eratosthenes

Technical Skills

Languages Java, Python, C/C++, JavaScript, MATLAB

Libraries NumPy, Pandas, MatplotLib, Standard Template Library, TensorFlow, OpenCV, Keras

Web Development HTML, CSS, JavaScript, NodeJS, MongoDB, Django, ReactJS

Other Skills Machine Learning, Deep Learning, Competitive Programming

Relevant Courses

Undergrad-level Courses Probability and Stochastic Processes, Discrete Mathematical Structures, Digital Logic and System Design, Data Structures and Algorithms, Linear Algebra & Differential Equations, Calculus, Computer Architecture* , Programming Languages*, Design Practices*

Relevant Online Courses Deep Learning (DeepLearning.ai), Improving Deep Learning Networks(DeepLearning.ai), Machine Learning (Stanford online), Mastering Data Structures and Algorithms in C++, Convolutional Neural Networks(DeepLearning.ai), Sequence Models(DeepLearning.ai)

* to be completed

Positions of Responsibility

June 2021 - Present **Member Technical Team**, *Entrepreneurship Development Cell, IIT Delhi*
• Designed and Developed an Internship Portal for IIT Delhi startups and students.
• Developed the back-end, made connections with the Database and designed API's for being consumed by the frond-end using Python, Django and Django REST Framework

April 2021 - Present **Executive**, *Algorithms and Coding Club, IIT Delhi*
• Designed problems and conducted several Competitive Programming contests for IIT Delhi students
• Organized SoCP (Summer of Competitive Programming) to help students get started in Competitive Programming and conducted live lecture sessions and online discussions

July 2021 - Present **Executive**, *ACES-ACM, IIT Delhi*
• Organized several events, for the Computer Science departmental society