Aakash Garg

Junior Undergraduate, Indian Institute of Technology Delhi

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Academic Details

DEGREE/EXAM	CGPA	INSTITUTION	YEAR
Maths and Computing, B.Tech(Dual)	8.69/10	IIT DELHI	2018-2023(expected)
Class XII, CBSE Board	92.6%	Sanjay Gandhi Public School	2018
Class X, CBSE Board	10/10	Army Public School	2016

Scholastic Achievements

- Joint Entrance Examination (JEE) **Advanced** Rank: **343** (out of 1.2 million candidates).
- **INTERNATIONAL OLYMPIADS, 2018 :** Qualified NSEC (National Standard Examination in Chemistry) and placed in **National Top 1%** out of 40,000 candidates, by IAPT.
- **Kishore Vaigyanik Protsahan Yojana (KVPY), 2018 :** Selected as **KVPY Scholar** after securing **All India Rank 312** (out of 150K candidates) by **IISc Bangalore**.

Work Experience

CLAN LABS, PURDUE UNIVERSITY, IN, USA Summer 2020

Prof. Vaneet Aggarwal, Associate Prof.

- Summer Internship on a Deep Learning project on **Generative Adversarial Networks** (GAN).
- Integrated comparision data into the framework to achieve the **State-Of-The-Art** classification accuracy.
- Got nice results on using **Triple Generative Adversarial Networks** for continuous label learning problems. Planned to further expand the results for a **publication** .

AAROHAN SUMMER INTERNSHIP Summer 2019

NSS, IIT DELHI

- Volunteered with Aarohan program (NSS) as a mentor that aims to provide quality education to the economically weaker students.
- Organised regular teaching classes and created best content with varying difficulty.

Projects

PARALLEL SORT

Prof. Subodh Kumar, Parallel Programming Oct, 2020

- Implemented a sorting library consisting of collective parallel sort functions such as **Hypercubic Quicksort, Mergesort and Radixsort** that can sort **BigData with 5 billion** keys on a single pass.
- The implementation is based upon the **MPI and OpenMP** programming paradigm using multi-threading techniques and inter-process synchronization.
- The scalability and efficiency of the library is tested upon **HPC using shell scripting.** The library achieves an exceptional **speedup efficiency of 90%.**

DETECTION-OF-ORGANS-IN-ULTRASOUND-IMAGES

Prof. Chetan Arora, Computer Vision Sept, 2020

- Implemented a python program that identifies the position of a **Gall-Bladder in an Ultrasound Image.**
- Applied various image-processing techniques such as max filters to remove **speckle noise.**
- The performance is analysed using **IoU Score** calculated using detected and actual object positions.

BASEBALL-ELIMINATION-PARAMETRIC-MAX-FLOW

Prof. Minati De, Algorithm Design April, 2020

- Implemented max flow network to calculate baseball eliminations using the **Ford-Fulkerson** algorithm.
- Efficient Implementation both in terms of space and time through the modified algorithm using the ideas of Parametric Max Flow.
- Compared the results and efficiency of the **modified algorithm** with the old one.

GENERIC-ADVANCED-DATA-STRUCTURES
Prof. Subodh Kumar, Data Structures Nov, 2019

- Implemented the 3 advanced data structures namely **Trie, RedBlackTree** (self balancing) and **MaxHeap**.
- These data structures are completely generic and process queries in **O(log(n))** complexity and hence can be used for optimization at large scales containing large datasets.
- Optimal choice is made accordingly by comparing the efficiency of these data structures on different inputs.

A-MULTITHREAD-ECOMMERCE-EXCHANGE
Prof. Subodh Kumar,, Data Structures Sept, 2019

- Efficient implementation of priority queue and thread programming.
- Handled multi-process at single time using Inter-thread Synchronization.
- The items will be bought from the highest priority sellers implemented efficiently with the help of a priority queue.

DEEP-LEARNING-SPECIALISATION
Self Project, Python Winter 2019

- **Face-Recognition-System** : Use a pretrained model to map face images into 128-dim encodings to perform face verification and face recognition.
- **Car-Detection-using-YOLO** : Implemented YOLO algorithm which runs an input image through CNN and outputs a volume that contains information regarding the objects detected.
- **Neural-Style-Transfer** : Implemented transfer learning using neural style transfer algorithm in which artistic images are generated using the style image and the content image.
- **Hand-Written-Digits** : Implemented one-vs-all logistic regression to recognize hand-written digits in the MNIST dataset.

Relevant Courses

- **ONGOING :**
  Computer Vision, **Financial Mathematics**, Parallel Programming, Computer Architecture, Linear Algebra & Applications, Numerical Methods and Computation, Microeconomics
- **COMPLETED :**
  Analysis and Design of Algorithms, Discrete Mathematical Structures, Data Structures and Algorithms, Probability Theory and Stochastic Processes, Optimization Methods and Applications, Digital Logic and System Design, Differential Equations, Calculus.
- **ONLINE :**
  Introduction to TensorFlow, Neural Networks and Deep Learning, Structuring Machine Learning Projects, Convolutional Neural Networks, Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Machine Learning.

Technical Skills

Programming Languages	C, C++, Python, Java, MatLab
Softwares and Frameworks	Open-MPI, OpenMP, OpenCV, Tensorflow, Keras
Web Development	HTML, CSS, Javascript

Position of Responsibility

- **Alumni Affairs Seceratary** : Responsible for conducting various Alumni events, career oriented sessions and raising funds.
- **Academic Mentor** : Responsible for guiding freshers focus on their academic and holistic development by organizing doubt clearing sessions every week.
- Organised various gaming and cultural events at the hostel and inter-hostel level.

Extra-Curricular

- **Competitive Programming**: Regularly participate in coding contests & currently a 4* coder on Codchef.
- Won first prize in **Monopoly: The Math Edition**, Enigma 2019, Lady Sri-Ram College, Delhi.
- Won 2nd prize in inter-hostel Kabbadi and 3rd prize in PUBG gaming tournament.