Navjinder Singh Virdee

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Computer Science and Machine Learning Student

A final-year *Computer Engg* student at **Thapar University.** Throughout my **academic years**, I have always been amongst the **top students**, and would continue to do my best in the future as well. Completed **Deep Learning Specialization**, **Machine Learning Course** and **Data Structures and Algorithms Specialization** from Coursera. I enjoy participating in online **competitive coding contests** and **machine learning challenges** on **CodeChef**, **HackerRank**, and **Kaggle**.

Education

B.E in Computer Engineering	**C.G.P.A - 8.95**
Thapar University, Punjab, India	Graduation - 2019
Class XII (CBSE)	**Percentage - 94%(PCM)**
Budha Dal Public School, Punjab, India	Year - 2015
Class X (CBSE)	**C.G.P.A - 10.0**
Budha Dal Public School, Punjab, India	Year - 2013

Work Experience

Software Developer Intern	**Jun 2016 - Jul 2016**
Times Internet Limited, Times Group	

Build a **Search Suggester**, based on the queries searched by the users, for **Dineout** website. My task was to design and implement a program which would take all the searched queries of the past 7 days, as Input everyday, then computes the most popular queries and stores them as suggestions in the database. Used **Eclipse IDE** and **Java** language to develop the project and **MySQL** DBMS for storing the computed suggestions in the database.

Projects

AI Plays 2048 (Deep Reinforcement Learning)	**2018**

The task was to teach the computer to play 2048 game by itself without any kind of human help. Trained a Deep Q Network using a Convolutional Neural Network to play the famous 2048 game. Used Python to develop the project and achieved a highest tile of 4096 in the game.

Neural Networks from Scratch	**2018**

Implemented LSTM, CNN, NN using only Numpy library. Used Python to develop the project in Jupyter Notebook.
- **Long Short-Term Memory Network**: Predicted people's first names by training the algorithm on a dataset of 20,000 names. Achieved a perplexity score of 1.05.
- **Convolutional Neural Network:** Classified HandWritten images of digits (0-9) by training the algorithm on a dataset of 30,000 images of 28x28 pixels. Achieved an accuracy of 87% on test dataset.
- **Neural Network**: Implemented one-hidden layer neural network to classify the Iris dataset. Achieved accuracy of 97%

Assembled Phi X174 Genome Using Overlap Graph, K-mer Composition, DeBruijn Graph	**2017**

This Capstone Project was part of *Data Structures and Algorithms Specialization* on *Coursera.* In this Project I **:**
- Developed algorithms for constructing **overlap** and **debruijn graphs.**
- Developed two algorithms for detecting and *correcting* the **errors** in the reads**:**
  - ❖ Tip removal algorithm   ❖ Bubble detection and removal algorithm
- Developed the following algorithms for finding **cycles** in the **directed graphs:**
  - ❖ Eulerian Cycle algorithm   ❖ Greedy Hamiltonian Cycle algorithm

Advanced Shortest Paths - Contraction Hierarchies Algorithm, Bidirectional Dijkstra, A-star Algorithm
This project was part of *Algorithms on Graphs* course on *Coursera.* The task was to implement following algorithms:

- Implemented **Contraction Hierarchies Algorithm**, learned to improve the efficiency of the algorithm by *pre-processing* the graph. Learned about working of algorithms used in navigation apps.
- Developed **A-star Algorithm**, and learned to use *coordinates* to improve the efficiency of the algorithm by doing a **directed search** in the graph.
- Developed **Bidirectional Dijkstra Algorithm**, and learned about its applications in the **social networks**.

Professional Development

Deep Learning Specialization(Coursera)   **Jan - April 2018**
- **Neural Networks and Deep Learning & Improving Neural Networks**
  - Understood the major technology trends driving Deep Learning.
  - Easily able to implement and train efficient (vectorized) deep neural networks.
  - Understood the concepts of hyperparameter tuning, regularization and optimization.
  - Learned about how to apply end-to-end learning, transfer learning, and multi-task learning.
- **Convolution Networks and Sequence Models**
  - Understood how to build a convolutional neural network, including recent variations such as residual networks.
  - Learned to apply CNN for Face Detection, Neural Style Transfer and Object Detection.
  - Learned how to build and train Recurrent Neural Networks (RNNs), and commonly-used variants such as GRUs and LSTMs.
  - Learned to apply sequence models to natural language problems, including text synthesis.

Machine Learning Course(Coursera)   **Jun - Jul 2017**

- Learned **Supervised Algorithms** - parametric/non-parametric algorithms, SVM, kernels, neural networks.
- Learned **Unsupervised Algorithms** - clustering, dimensionality reduction, recommender systems.
- Learned **bias/variance theory;** innovation process in machine learning and AI.
- Learned ways to apply learning algorithms to building smart robots, text understanding, computer vision, and other areas.

Data Structures and Algorithms Specialization(Coursera)   **Jan - Jun 2017**
- **Algorithmic ToolBox & Data Structures:**
  - Learned algorithmic techniques - **Dynamic programming, Divide and Conquer, Greedy Algorithms.**
  - Learned about tradeoffs and time complexities involved in using each data structure -**Big-O notation, Amortised Analysis.**
  - Implemented advanced data-structures-**Hash Tables, Trees, Priority-Queues, Disjoint Sets, Lists.**
- **Algorithms on Graphs and Strings:**
  - Learned **shortest paths algorithms** — from the basic ones to those which open door for 1000000 times faster algorithms used in Google Maps and other navigational services.
  - Learned **minimum spanning trees** which are used to plan road and computer networks and also find applications in clustering and approximate algorithms.
  - Learned **search algorithms** used by search engines to make sense of all text information and make **search efficient** and to find **disease-causing mutations** in the human genome.

Honors and Awards

- Received **Merit Scholarship**, for being in top **10%** amongst **423** COE students in 2016-2017.
- Awarded **Gold Medal** for being in the top **4%** amongst **12,760** participants in Week of Code 36 (Hackerrank).
- Achieved **4th position** (Country-Rank) in the Rookie Rank 4 competitive coding contest(HackerRank).
- Amongst the **top 10%** out of 9000 participants on **Kaggle** in Titanic : ML from Disaster Challenge.