PARTH SINGHAL

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EDUCATION

Bachelor of Technology, Chemical Engineering July, 2018 - July, 2022
Indian Institute of Technology Delhi : CGPA **8.135**

CBSE, Class XII March 2018
Cambridge Court High School, Jaipur : Percentage **90.8**%

SCHOLASTIC ACHIEVEMENTS

- **Foreign Exchange** 2020: Cleared interview; among 1 in 3 students selected to represent IITD at IMT Ales, France
- **Global Engg. Leadership Scholar** 2020: 1 in 30 students globally selected for internship at NTHU, Taiwan
- **National Talent Search Examination** 2016: Awarded fellowship from the NCERT, Government of India

INTERNSHIPS

- **Flatiron Institute, Simons Foundation, New York, USA**: *(Ongoing)*
  – Investigating 3D reconstruction of protein conformations using **Deep Learning** and **Probabilistic Modelling**
  – Comparative analysis of **VAE** based generative models for extracting heterogeneous data from cryo-EM datasets
- **National Tsing Hua University, Taiwan**: *Thermographic Image Data Analysis for NDT* *(May-July, 2020)*
  Guide: Prof. Yuan Yao, Department of Chemical Engineering, NTHU Taiwan
  – Implemented Machine Learning models for identification of defects from infrared images of Composite Materials
  – Used **Slow Feature Analysis** to extract slow varying features from temporally & spatially varying image data
  – Generated SFA feature images using the multivariate slow varying features & identified defect locations in the images
  – Used **Penalized Least Square** algorithms for post-processing of SFA images, reduced disturbances from the images
  – Computed **Signal-to-Noise Ratio (SNR)** values to compare results obtained using Slow Feature Analysis & **PCA**
  Working on the first draft of the research paper based on this project, which will be submitted in a reputed journal
  Received a Letter of Recommendation from the project supervisor for outstanding contribution during the internship

TECHNICAL SKILLS

- Python || *C++* || *Java* || *MATLAB* || *R* || *LaTex* || *git* || *ANSYS* || *Linux shell commands* || *Autodesk*

PROJECTS

- **Recommendation System for Spotify's Million Playlist Dataset Challenge** *(November, 2020-January, 2021)*
  Guide: Prof. Srikanta Bedathur, Computer Science Department, IIT Delhi
  – Implemented playlist-based **collaborative filtering** (CF) algorithm over the Spotify's Million Playlist dataset
  – Used the **doc2vec** algorithm to find the similarity between the playlist titles, for the Cold Start Problem
  – Ensembled doc2vec and CF models to achieve a **NDCG** & **R-prec** score of **0.3312** & **0.1835** respectively
- **Vector Space Retrieval (VSM) Model** *(October, 2020)*
  Guide: Prof. Srikanta Bedathur, Computer Science Department, IIT Delhi
  – Developed an end-to-end Vector Space Retrieval Model incorporating **Prefix Search** & **Named Entity Restriction**
  – Achieved a **NDCG** and **F1 score** of **0.2322** and **0.1527** respectively, on the TREC dataset
- **Database Management System for Employees** *(March, 2021)*
  Guide: Prof. Amit Kumar, Computer Science Department, IIT Delhi
  – Designed a database management system using generic Tree data structures to maintain employee info & org hierarchy
  – Database supports queries for employee search and list in a time and space efficient manner using an **AVL Tree**
- **Event Based Simulation of Restaurant Billing Counter** *(April, 2021)*
  Guide: Prof. Amit Kumar, Computer Science Department, IIT Delhi
  – Implemented a distributed, highly scalable & discrete event driven simulation environment in Java for a food joint
  – Used **MinHeap** & **AVL Tree** data structures to maintain event distribution & customer data in an efficient manner
- **Naive Bayes Classifier for Spam Filtering** *(March, 2021)*
  – Implemented Naive Bayes **Binary Classification** algorithm and **Laplace Smoothing** for email spam detection
  – Used **7 fold cross validation** for the optimization of the classifier model and achieved a best case accuracy of **72%**