PARAMANSH SINGH

Senior Undergraduate, CSE, IIT Kanpur

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EDUCATION

IIT Kanpur

B.Tech, Computer Science & Engineering

2016 – Present Kanpur, India

CPI : **9.7/10.0**

Bhupindra International Public School

CBSE Class 12

2016 Patiala, India

Performance : **96.8%**

St. Peter's Academy

CBSE Class 10

2014 Patiala, India

CGPA : **10.0/10.0**

ACHIEVEMENTS

- Academic Excellence Award : 2016, 2017, 2018
- All India Rank **158** : JEE - Advanced
- All India Rank **58** : JEE - Mains
- All India Rank **12** : KVPY
- State Rank **7** : Regional Mathematics Olympiad
- State Rank **1** : NTSE Scholarship

SKILLS

C, Python, C++, Tensorflow, Bash
JavaScript, HTML, SQL, Git
PyTorch, Go, MongoDB, CSS

COURSES

A*	Data Structures and Algorithms
A*	Randomized Algorithms
A*	Multivariable Calculus
A*	Linear Algebra & Differential Equations
A*	Time Series Analysis
A	Algorithms-II
A	Introduction to Machine Learning
A	Probability and Statistics
A	Computer Organization
A	Abstract Algebra
A	Operating Systems
A	Cyber-Security of Critical Infrastructures

i : in progress A* : exceptional performance

EXTRA-CURRICULAR

- **Coordinator** Assc. of Computing Activities, IITK
- **Tutor** Introduction to Computing
- **Academic Mentor** Counselling Service, IITK
- **Student Guide** Counselling Service, IITK

EXPERIENCE

Apps Search & Intelligence Team, Google

Software Engineering Intern

May 2019 – July 2019 Bangalore, India

- Worked on improving the ranking of Gmail Search results by analyzing different neural network architectures and tuning hyperparameters.
- Achieved **0.19%** MRR gain using ensemble model, and **0.20%** MRR gain by introducing a pre-clustering layer and loading query specific weights.
- Tried out sequence models, LSTM, GRU, bidirectional LSTM, over query and document subject embeddings. Got **0.13%** improvement in MRR.
- Explored attention models of query over document subject embeddings to improve over sequence model latency.

University of Texas at Dallas

Research Intern (remote), Prof. Vincent Ng

May 2018 – July 2018 Kanpur, India

- Analyzed Amazon's 5-core product review dataset to find the relation between helpfulness and review star rating for three different datasets.
- Developed a **plagiarism checker** module using k-grams fingerprinting and winnowing to dismiss the dependence on text quality only.
- Employed state-of-the-art **aspect extraction** using NLTK and POS tagging to examine relationship between helpfulness and number of aspects.
- Used linear regression to predict helpfulness as a function of review time, content and star rating.

PROJECTS

Object Detection & Tracking *Course Project, Visual Recognition*

- Implemented an **unsupervised real-time** object detector, classifier, and tracker for IIT Kanpur surveillance camera footage using **SORT** with **YOLO**.
- Applied unsupervised **Domain Adaptation** by Backpropagation for object classification and got **2.1%** accuracy improvement.

Representation Learning on Graphs *Course Project, Machine Learning*

- **Objective:** Learn efficient, task independent feature representation for Graphs and use it for **Node Classification** and **Link Prediction**.
- Analyzed various representation learning models: DeepWalk, LINE, node2vec and compared their performance, and built a **recommender system**.

Technical Assistant Chatbot *Summer Project, Programming Club*

- Implemented a retrieval-based, closed domain chatbot using a Dual Encoder LSTM network and trained on the Ubuntu Dialog Corpus (UDC).
- Employed LSTM and word embeddings of prior context and responses to generate a prediction and obtain the distribution of sampled responses.

Secure File System *Course Project, Computer System Security*

- Built a cryptographically authenticated file store in **Go**, secure against vulnerabilities in server, preserving data **integrity**, and **confidentiality**.
- Developed **share** functionality allowing users to securely share file with other users and revoke when needed.

Go Compiler *Course Project, Compiler Design*

- Implemented a fully functional x86 compiler in Python for a subset of Go programming language.
- Incorporated advanced features like multi-level pointers, multi-dimensional arrays, operator overloading, file I/O, and dynamic memory allocation.