Aditya Makkar

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EDUCATION

IIT DELHI
BTech in Mechanical Engineering
Graduated May 2016
GPA: 7.638/10

RESEARCH INTERESTS

Machine Learning
Optimization
Theory

COURSEWORK

Introduction to Computer Science
Data Structures
Artificial Intelligence
Machine Learning
Natural Language Processing
Multivariable calculus
Linear algebra
Complex analysis
Probability and Stochastic processes
Number Theory
Econometric methods
Robotics

PROGRAMMING

Python | Java | C++
PyTorch | TensorFlow
MATLAB | LaTeX

OTHER INTERESTS

Recreational Mathematics
Weightlifting
Badminton
Football

WORK EXPERIENCE

GOLDMAN SACHS | Research Analyst

June 2016 - Present | Bangalore, India

Member of statistical modeling team within Surveillance Analytics Group of Compliance division. Responsible for researching and developing mathematical tools for surveillance models which must process huge amounts of data and flag suspicious activities.

- **Text Summarization:** Implemented affinity propagation clustering algorithm for this. Several heuristics were applied over the vanilla affinity propagation.
- **Word2Vec:** Trained using the Python library gensim. Wrote code to update a trained model with new data.
- **Fuzzy Name Matching:** Used Ukkonen's edit distance based algorithm and implemented it in a MapReduce environment.
- **Anomaly detection:** Used variational autoencoder to flag anomalies.
- **Search engine:** A natural language based search engine. Responsible for the query expansion task using synonyms and spell correction.
- **Latent Dirichlet Allocation (LDA):** Used for improving ranking for our search engine and detecting anomalous emails. This project was done in collaboration with **Prof. John Paisley of Columbia University**

INTERNSHIPS

- **Goldman Sachs (May 2015 - July 2015):** Tested the accuracy and time performance of MLlib (Machine Learning Library) in Apache Spark. Developed and implemented algorithms for time series segmentation.
- **Centre for Development of Advanced Computing (C-DAC) (May 2014 - July 2014):** Studied various benchmarking algorithms for high performace computing and wrote a technical report.

PROJECTS

BTECH THESIS | Operations Research

July 2015 – May 2016 | Prof. Nomesh Bolia, Mechanical Department, IIT Delhi

- Optimizing production of railway coaches to maximize revenue using Linear Programming. This was done in collaboration with **Ministry of Railways, India.**
- Solved the problem of efficient container loading for double stack container freight trains using Integer Linear Programming.

PEDESTRIAN ACCIDENT ANALYSIS | Computer Vision

Jan 2015 – May 2015 | IIT Delhi

- Coded Histogram of Oriented Gradients and linear SVM in MATLAB to detect pedestrians and flag accidents at road intersections and alert authorities.

QUORIDOR PLAYER | Artificial Intelligence

Jan 2015 – May 2015 | IIT Delhi

- Designed an adaptive AI player using UCT Monte-Carlo Tree Search algorithm and depth limited adversarial search algorithms.

AWARDS

- **IIT Delhi Semester Merit Award (2 times):** batch top 7%. 2012-2013
- **Indian National Mathematical Olympiad (INMO) finalist (2 times):** 3rd rank in the state of Uttar Pradesh in Regional Mathematics Olympiad (RMO). 2012
- **KVPY fellowship:** 250 students nationally by Government of India. 2012
- **NTSE scholarship:** 1000 students nationally by Government of India. 2008