Akshit Tyagi

Junior Undergrad Electrical Engineering
Indian Institute of Technology, Delhi

Ph. No: +918527505197
akshit.ee114@ee.iitd.ac.in
akshitt795@gmail.com
akshittyagi.github.io

Education

- **Indian Institute of Technology, Delhi** — New Delhi, India
  B.Tech. in Electrical Engineering, CGPA: 8.8 — *2014 - 2018 (expected)*
- **Delhi Public School, R.K. Puram, Std. XII** — New Delhi, India
  Graduated with a 97.0 aggregate percentage — *Graduated in 2014*
- **Delhi Public School, R.K. Puram, Std. X** — New Delhi, India
  CGPA: 10.0 — *Graduated in 2012*

Work Experience

- **Summer Engineering Intern** — NVIDIA, Bengaluru, India
  CPU Verification and Testing Team — *May - July 2016*
  - Worked on handling undefined opcodes for an architectural simulator. This involved handling instruction level access for the CPU and the execution of exception return.
  - QEMU was used to emulate an ARM environment for CPU architectural testing. This was used to compare native performance with the simulator and improve upon the perf-per-watt characteristics.
- **Winter Software Engineering Intern** — Dealsnprice.com, Gurgaon,India
  Deep Learning and Image Search Team — *Nov. '15 - Jan. '16*
  - Worked on Deep Learning framework's(Caffe) integration with ROS for deploying image search using object detection for e-commerce applications. This used implementation and optimization of ConvNet algorithms to optimize feature extraction and use it to find embeddings for k-Nearest Neighbour recommendations.
  - SIFT features were also used to make sure scale invariance and hence made the embeddings more useful for k-NN algorithms. This will now be deployed on an Android application for production.

Projects undertaken

- **Predicting Stock prices using Echo State Networks** — Independent Project, IIT Delhi
  Oct.-Nov. 2016
  - Used an Echo State Network(ESN) for the time series prediction of the stock market index of various stocks. The ESN was trained on the past 3 years of data and was able to predict the stock market index for the next 10 days with an average accuracy of 90%.
  - ESN being a reservoir RNN, had very little computational overhead and thus was easily trained on very large datasets easily.
  - This was combined with a Sentiment Analysis signal from the Twitter feed data of large corporations handling the stocks on a daily basis. Thus, effectively combing these two models, we were able to get a confidence metric for our ESN prediction.

- **Facial Recognition using Fisher and Eigen faces** Independent Project, IIT Delhi
  Project with Prof. Sumantra Dutta Roy *Mar. - May 2016*
  - Worked on implementing a facial recognition applet that uses Fisher's Linear Discriminant method to train and classify faces from a training set.
  - The program maximized the between-class-scatter(photos of different people) and minimized the within-class-scatter(different photos of the same person).
  - The trained model could then discriminate between different faces under variable lighting and facial expression.

- **Background Detection in a Video Stream** Machine Learning(Course), IIT Delhi
  Course Project *February 2016*
  - Developed a program that could detect Background and Foreground pixels using the Background Subtraction technique (using Gaussian Mixture Models).
  - Each pixel(three channel) was modeled as mixture of Gaussians, the Gaussian(s) with the minimum variance were chosen to describe a background pixel.
  - Used OpenCV to process the video file as a sequence of Image Matrices, and create two separate output files containing the Background and Foreground video streams.

- **A Small Search Engine using Inverted Page Index** Data Structures(Course), IIT Delhi
  Course Assignment *October 2015*
  - Made a small Search Engine that can return a list of most relevant queries for word(s)(phrases,and,or statements can be handled) using HashTable lookup in an InvertedIndex for a set of pages. The data storage included implementation of AVL Trees for faster lookups for phrase queries. Code can be found at https://github.com/akshittyagi/SmallSearchEngine

Awards, Grants & Honours

Design & Innovation Summer Award(DISA)	IIT Delhi,2015
Institute Award for being a student in the top 7% in the first year	IIT Delhi,2014-2015
National Talent Search Examination 2010	NCERT, July 2010
KVPY Fellowship 2012-13	DST,2013
Indian National Chemistry Olympiad 2014, Top 50	HBCSE,February 2014
Junior Science Talent Search Examination 2011, 2nd Position	Govt. of Delhi,July 2011

Relevant Courses Taken

Communication Engineering	Parallel Programming*	Machine Learning
Data Structure and Algorithms	Course in Analysis of Algorithms in Java	Operating Systems*
Probability and Stochastic Processes	Linear Algebra and Differential Equations	Calculus
Computer Architecture	Artificial Intelligence	Deep Learning

*Courses to be completed in the Spring Semester of 2017

Designing and Programming Skills

Extensive	C/C++, Java, Python, MATLAB, Bash(Unix Shell) Scripting
Intermediate	Caffe, JavaScript, Android Studio
Basic	TensorFlow, CSS , Mathematica