Akshit Tyagi

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Junior Undergrad Electrical Engineering
Indian Institute of Technology, Delhi

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Education

- **Indian Institute of Technology, Delhi** — New Delhi, India
  B.Tech. in Electrical Engineering, CGPA: 9.293 — *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.- Dec. 2015*
  - Worked on Deep Learning Algorithms involving implementation and optimization of Convolution Neural Network algorithms to optimize image search and object detection for an e-commerce website.
  - It included working on machine learning algorithms to extract features from images, storing it as a Bag-of-SIFT words and classifying it according to k-nearest neighbours.

Projects undertaken

- **Background Detection in a Video Stream** — Machine Learning(Course), IIT Delhi
  Course Assignment — *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.
  - OpenCV was used to process the video file as a sequence of Image Matrices, and create two separate output files containing the Background and Foreground video streams.

- **Facial Recognition using Fisher and Eigen faces** Machine Learning(Course), IIT Delhi
  Course Assignment *April 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.

- **Automated Renting and Vending Machine** IIT Delhi
  Design Innovation Summer Award (DISA) under Prof. M. Balakrishnan *May-July 2015*
  - Prototyped a product which can rent out umbrellas and accept them back. Implemented image processing for detecting the change(s) in the umbrella before it was vended out. This enabled us to build a verification system to detect if any damage has been done to the product.

- **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*	Digital Logic and Circuits	Machine Learning
Data Structure and Algorithms	Course in Analysis of Algorithms in Java	Electromagnetics
Probability and Stochastic Processes	Linear Algebra and Differential Equations	Calculus
Deep Learning*	Artificial Intelligence*	

*Courses to be completed in the Fall Semester of 2016-17

Designing and Programming Skills

Extensive	C/C++, Java, MATLAB, Bash(Unix Shell), Python
Intermediate	JavaScript, XML, Android Studio
Basic	CSS, HTML5, Mathematica