Kuldeep Sharma

Senior Undergraduate
Dept. of Mechanical Engineering, IIT Delhi

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Objective and Areas of Interest

Objective: To pursue higher studies in the field of Artificial Intelligence and Machine Learning

Areas of Interest: Machine Learning, Deep Learning, Computer Vision and Probability & Statistics

Education

Indian Institute of Technology Delhi — **Hauz Khas, New Delhi**
Undergraduate in Production and Industrial Engineering,
Dept. of Mechanical Engineering, May 2017

Delhi Public School — **Panipat, Haryana (India)**
Senior Secondary,
Central Board of Secondary Education, May 2012
Percentage: 89.2%

Courses Taken

Natural Language Processing	Machine Learning	Computer Vision
Data Structures	Graph Algorithm	Introduction to Algorithm
Operating Systems	Introduction to Statistics	Linear Algebra
Probability & Stochastic Process	Quantum Mechanics	Numerical Method of Computation

Online courses: CS-229 (Machine Learning) and CS-231n (CNN for Visual Recognition) from Stanford's website

Technical Skills

Programming Languages: C++, Java, python (**caffe, Opencv**)
Softwares: Matlab, AutoCAD, Solidworks, Ansys

Academic Achievements

— All India Rank 1438 out of 13,00,000 candidates in **JEE Advance 2013**
— Ranked among top 0.5% candidates in **JEE Mains 2013**

Experience

Vision and Graphics Lab, IIT Delhi **May, 2016 - Current**
(*Prof. Subhashis Banerjee and Prof. Sudipto Mukherjee*)

— **Roadsides Classification using Deep Learning**
- Fine-tuned state-of-the-art Deep Networks(AlexNet, VGG16) on the dataset of Indian roadsides and used them to classify roadsides.
- This can be used for the better control of the autonomous vehicles.

— **Object Detection on roads Using Deep Learning**
- Developed a program for object detection using **VGG16** and **ResNet** with Faster-RCNN, used **caffe's python** wrapper for the implementation of Deep Networks.
- For pedestrian detection, implemented **Kalman Filter** to track pedestrian in the missing frames to overall improve the performance of our program.
- Experimented with all state-of-the-art Deep Networks such as **ResNet, VGG16, AlexNet** for image classification task on Indian road images to bolster my understating of Deep Networks

Impact Simulation Lab, IIT Delhi **May, 2015 - December, 2015**
(*Prof. Anoop Chawla)*

— **Mesh Generation using Delaunay Triangulation**
- Worked as a member of **research team** of **IIT Delhi** for an open source software **PIPER** for **European Union Research Organisation**
- Developed a c++ program for Mesh Generation of solid objects given their nodal points in space, using Delaunay Triangulation
- Implemented 2 different papers *Shelling Algorithm* and *Divide & Conquer Algorithm*

Course Projects

Computer Vision, IIT Delhi **July, 2016 - November, 2016**
(*Prof. Subhashis Banerjee)*

- Implemented higher order clustering algorithm such as Spectral and Subspace clustering for image segmentation task, implemented paper "**Efficient Higher-Order clustering on Grassmann Manifold**" for the image segmentation task on depth images
- Used **SIFT** to extract key-features form images and then implemented a **Vocabulary-Tree** using standard libraries on Indian images
- Implemented **Baker** and **Matthews's** paper "***Lucas-Kanade 20 Years On: A Unifying Frameworks***" for the video and image stabilisation

Machine Learning, IIT Delhi **January, 2016 - April, 2016**
(*Prof. Sumeet Agarwal)*

- Implemented a **CNN** in caffe and trained it on the standard MNIST dataset and achieved an accuracy of 99.843% on Kaggle's Digit recognition competition
- Implemented Neural Network in python without using any library, experimented with it by varying the various hyper parameters such as number of layers, activation function etc.
- Implemented **GMM** in Matlab and compared results with the standard K-means & GMM
- Compared the performance of supervised learning vs unsupervised learning by using K-means(with K=10) and SVM algorithms on the same MNIST dataset

Data Structures, IIT Delhi **January, 2015 - April, 2015**
(*Prof. Amit Kumar)*

- Implemented a rudimentry flight trip planner using **Dijkstra's** Algorithm
- Implemented **Heap** to simulate billing counter to minimise waiting time for customers
- Implemented an **AVL-tree** to manage the employee records for a company

Other Interests & Activities

Competitive Programming, Music(Vocalist and Guitarist), Movies && Tv-Series,
Hockey(House Captain) and watching every sport