

Kuldeep Sharma

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Currently, I am working as a **Research Assistant** with Prof. Siew Kei at NTU

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, July 2013 - May 2017
CGPA: 7.45/10

Delhi Public School

Panipat, Haryana (India)

Senior Secondary,
Central Board of Secondary Education, July 2010 - May 2012
Percentage: 89.2%

Courses Done:

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

Online Courses: CS-231n(CNN for Visual Recognition) & CS-229(Machine Learning) from Stanford's Website

Technical Skills:

Programming Languages: C++, C, Java, Python(Caffe, TensorFlow, OpenCV, PyTorch), Matlab

Academic Achievements:

- All India Rank 1438 out of 1 Million candidates in JEE Advance 2013
- Ranked among top 0.5% candidates in JEE Mains 2013

Experience:

Hardware and Embedded System Lab, NTU
(Prof. Lam Siew Kei)

November 2017 - Current

— **CNN acceleration using Structured Simplification Algorithms**

- Working on a method for pruning a CNN using final loss function with hard and easy examples from the dataset
- Developed a program to Prune SqueezeNet using the implementation of Pruning CNN for Resource Efficient Inference
- Developed a program for converting Deep Networks from PyTorch to Caffe model
- Experimenting on the state-of-the-art small size deep networks with various CNN acceleration algorithms

Vision and Graphics Lab, IIT Delhi
(Prof. Subhashis Banerjee & Prof. Sudipto Mukherjee)

May 2016 - May 2017

— **Roadside Classification using Deep Learning**

- Fine-tuned state-of-the-art Deep Networks (AlexNet, VGG16) on the dataset of Indian roadsides and used this dataset to classify the roadsides
- This classification can be used for the better control on 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 various state-of-the-art Deep Networks such as ResNet, VGG16, AlexNet, for image classification task on Indian road images to bolster my understanding of Deep Networks

Impact Simulation Lab, IIT Delhi
(Prof. Anoop Chawla)

May 2015 - December 2015

— **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 Divine & Conquer Algorithm

Course Projects:

Computer Vision, IIT Delhi
(Prof. Subhashis Banerjee)

July 2016 - November 2016

- 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 from images and then implemented a **Vocabulary-Tree** using standard libraries on Indian images

- Implemented **Baker** and **Matthew's** paper "**Lucas-Kanade20 Years On: A Unifying Frameworks**" for the video and image stabilisation

Machine Learning, IIT Delhi

January 2016 - May 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 a Neural Network in python without using any library, experimented with it by varying various hyper parameters such number of layers, activation function etc.
- Compared the performance of supervised learning vs unsupervised learning by using K-means(with K=10) and SVM algorithm on the MNIST dataset
- Implemented GMM in MATLAB and compared results with the standard K-means & GMM

Operating System, IIT Delhi

January 2017 - May 2017

(Prof. Sorav Bansal)

- Worked on a novel kernel architecture HoH (still under development at IITD) which makes use of exokernel approach
- Routines to context switch running fiber on timer interrupt were implemented. SPSC queue was implemented for message passing between cores
- Made a simple shell above the kernel to run some basic tasks. Implemented coroutine, fiber and a scheduler to manage multiple fiber running in the kernel using some basic API

Data Structures, IIT Delhi

January 2015 - May 2015

(Prof. Sumeet Agarwal)

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

Other Activity and Interest:

Computer Gaming, Music(Vocal), Movies & Tv-Shows, Hockey and watching every sports