Research Statement

Sujoy Ghosh

The momentum in modern machine intelligence and data analytics is towards learning from massive amounts of data. Many of these data sources-such as images, text, proteins and social networkshave a natural underlying structure. My research interests span *Machine Learning*, *Computer Vision*, and *Deep Learning*.

My interest in Machine Learning started to build up during a workshop organised by our seniors in my freshman year. I started with Andrew Ng's course *Machine Learning* on coursera and started implementing machine learning algorithms in python. Then, during past winter break, I started *Deep Learning* course by deeplearning.ai on coursera and finished it during semester.

The deep learning course gave me quite good insight to sophisticated deep leanring algorithms. This was a combination of five courses which started with a basic course on neural networks and vectorisation in which it made us implement the traditional cat identifier. Then it started with deep neural networks and improving them with hyperparameter tuning, regularization and different optimisation techniques. The course then moved to convolutional networks explaining different network architectures like ResNet, Inception etc. In this course, I was particularly fascinated by YOLO algorithm. Finally the course ended with seqnces model course which was mostly about NLP and audio processing. During the entire course I implemented almost all different algorithms taught during course using python and its various frameworks like tensorflow and keras.

Currently I am working on my course project *Classroom Visualiser* which recognises student present in class at any given time and augments a bounding box. I am trying to implement face recognition using YOLO algorithm to get better insight of this algorithm practically. Secondly I am developing a *Document Search Engine* which indexes documents in a folder and then

searches a text query and ranks document according to different ranking algorithms. I shall use machine learning to get better page ranking as per user browsing history.

I want to pursue my higher studies in deep learning and AI. I am also planning to build useful projects based on deep learning for better exposure.