Research Plan

NLP

Application

The field I will focus on in master and doctor course is the improvement of some deep learning basic algorithms and do some meaningful research in NLP based on machine learning. I have been learning basic knowledge of statistical machine learning and deep learning after work, but actually I’m still a newbie so I need to take much more time in my study and research.

Basically, machine learning itself often uses four strategies to solve problems above: supervised (e.g.: KNN), unsupervised (e.g.: cluster (e.g: K means), association) and semi-supervised(mixture algorithms) and reinforcement learning.

The first three machine learning strategies above mainly help us solve two main problems: classification and regression

Classification algorithms:

Regression algorithms:

Deep learning (is an online algorithm which can improve itself along with the streaming dataset): help us improve A\* heuristic function in shortest path finding algorithms, for example, we can use some graphs and their known heuristic algorithms as training dataset, we can even consider to use reinforcement learning to improve time complexity of A\* though it’s not very efficient because both of RL and A\* are greedy based strategy

So far, I have learnt some algorithms which are often used in Class

NLP application using algorithms above:

Sentiment analysis-> machine translation-> Q&A

In addition, I think currently the application of NLP technology is very limited. We may develop some more NLP applications in many more fields in the future. (e.g.: How to create a DSL which can recognize a part of natural language)

Reinforcement learning: another learning strategy beside supervised learning, unsupervised learning and semi-supervised learning.

Reinforcement learning uses a rewarding strategy which is based on Markov decision process. In Markov chain, following state is only depend on the current state. In addition,