**Directed study project outline – Sumei Xu**

**F-means**

Machine learning is so powerful today. It mimics human brain and makes machine ‘learn’ and do work or better work than human. Neural network achieves remarkably good results in recent years. However, even neural network did excellent performance on speech and image recognition, it does not perform that well on other data such as stock price prediction or sports game prediction, besides those, lots of data are still not predictable by using neural network.

The goal of this project is to reach a general principle or conclusion from some given examples by clustering data into clusters by using k-means, which narrows down data into ‘a smaller world’. After then, to each cluster, we use fuzzy rules to perform ‘labeling’. Here is an example, suppose you want to know if a basketball team would win this year’s championship, you may take some information such as team players name, age etc as input, and output the result of the basketball team performance(1-win,0-lose). This project should accomplish more extensive usage to data and achieve better or equal accuracy to existing machine learning methods.