## Assignment 2

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**Abstract**

This project concerns Deep Neural networks and analyzing how various factors affect the fitting and ultimate test set performance of these networks. The topology under focus is single versus multi-hidden layer networks. The project examines which model creates the best result and how multi-layers affects accuracy. The main aim is to emulate how a hidden layer learns features by constructing "classes" of input data where classes are perceived to be similar. Then the data is put into those classes that are perceived to have similar features. Lastly, five experiments are conducted to determine what the hidden nodes are actually learning. The experiments are: **Experiment 1:** DNN with 2 layers (no regularization), **Experiment 2:** DNN with 3 layers (no regularization), **Experiment 3:** CNN with 2 convolution/max pooling layers (no regularization), **Experiment 4:** CNN with 3 convolution/max pooling layers (no regularization) and **Experiment 5 :** You will conduct several more experiments. (a) Redo all the 4 experiments with some regularization technique. (b) Create more experiments on your own by tweaking architectures and/or hyper parameters.

**Introduction**