Project Proposal: Dog Breed Classification Using Neuro Network

- ## Problem and data set

  This project tries to identify the dog breeds by their images. It will be using the Stanford Dogs dataset, which contains 120 different breeds (categories) of dogs, added into 20580 total images. Labels (dog breeds) are provided.

- ## Who cares

  Dog classification is one of the fine grained image recognition problems, where the differences between categories are relatively subtle. In this case, for example, a Labrador retriever and a golden retriever are much more alike than a Labrador and a boat, hence it is quite a challenging problem in machine learning.
  Besides the technical challenge, it is also a practical problem to solve. If certain accuracy is achieved, it can be built into a dog lovers' app, which would be able to identify a dog's breed by a picture of it, and from there on the app can search from internet and finds out all the other information about that dog, such as its life span, disposition, and where it can be found etc.

- ## Approaches

  I would build and train 2 to 3 convolutional neuro network models with Keras, and compare the performance of each model. But the total number of images is probably too small to trained a neuro network to achieve high accuracy, thus I would also try to train a partially pre-trained CNN model, see if it can reach a satisfying accuracy.

- ## Deliverables

  The deliverables would be the trained models that from a dog's image, can categorize the dog's breed with certain accuracy.