**Final Project Proposal: Animal Image Recognition**

The proposal will elaborate the project that will be implemented for the final project. The final project will be an image recognition of animals in ten categories.

**Introduction**

Image recognition is always an essential topic as human’s vision is one of the most instinctive senses for human being. However, as image is stored in a complex structure, it is hard for computers to recognize the contents of the image. During the semester, the session has been working on digit recognition for multiple times by applying different machine learning algorithms. To further leverage the algorithms that have been covered in the semester, the author decided to work on more complicated images, which will be animal images. Different from digit image, animal images contain more noise and colors. The author aims to compare the performance of. The final project will also spend major time in deep neural network to optimize the performance of the model.

**Raw Data Description**

The dataset is from Kaggle, which is a set of image files that are categorized into ten animal categories. There are 26179 images, which means that they will be 26179 units of observation. Those data will be transferred into a data frame. Those images are categorized into ten following groups: dog, horse, elephant, butterfly, chicken, cat, cow, sheep, spider, and squirrel.

Link: https://www.kaggle.com/datasets/alessiocorrado99/animals10?select=translate.py

**Future Data Processing & Potential issues**

As the data does not contain any actual dataset, the images files are required to load into python and transfer them into data frame. Also, since all the images does not share the same resolution, a methodology of image processing is required.

**Possible Approach**

There are four possible approaches that the author would like to attempt: clustering, support vector machine, convoluted neural network and ensemble learning. Among them, the author is guaranteed to apply convoluted neural network and SVM due to their complexity. For CNN, the author will be highly cognitive towards the accuracy and try to improve the performance without overfitting the data.

Also, although there are already numerous posted models on the Internet with high accuracy, the author will not apply any of them before writing his own code. It would be a great experience to compare his code to the posted code.