

Capstone II Project Proposal

Image classification is a powerful tool used by companies in the fields of marketing, social media, healthcare, security, and many more. Social media companies use algorithms that can identify specific individuals within a picture and recommend that picture to the person in it, for example. Tech companies trying to develop self-driving vehicles heavily rely on image classification for their vehicles to recognize pedestrians, traffic signals, signs, etc. Security and law enforcement departments have advanced facial recognition algorithms that can find people of interest using CCTV cameras. These algorithms are also being used to help doctors identify cancer in patients before doctors would have normally been able to provide a diagnosis.

In this project, I will create an image classifying algorithm that will determine the breed of a dog based solely on an image. The dataset is split into a train and test file with 120 dog breeds listed. The training set contains the images and breeds of the dogs in the image. A deep learning neural network will be “taught” to recognize the dog breeds then predict which breed pertains to the images in the test dataset. Neural Networks become more precise the more data it’s provided in the training phase. Since the training dataset is limited and the amount of examples per breed are even fewer, the challenge will be in producing an algorithm with a high accuracy rate of prediction on the dataset provided.

This analysis will use Python and TensorFlow to create the deep learning algorithm. To build the algorithm I will first pre-process the images. This is the preparation phase for the images to be used in the neural network. Then, if necessary, the images will be reshaped for analysis. This is followed by the creation of a convolutional layer and a pooling layer. These steps are repeated to provide additional layers. Next an activation function will be applied to the layers. This is followed by a layer that will predict the classification of the image. This is the general approach which will be used, however,

unforeseen issues with the data may require additional measures to improve the accuracy of the prediction.

Once the algorithm is complete, a full report with the code will be provided. Along with this, a power point presentation will be available with highlights of the findings and delivery of the results.