

Capstone 2 Project Proposal

This capstone project aims to classify car images taken from users and using deep learning will create an algorithm that can return the manufacturer, model, and year of the car photographed. To train the model to accurately predict the information required to successfully classify the car the Stanford Car Dataset will be used. This dataset was found on Kaggle and contains over 16,000 images for 196 classes of cars. The data is already split roughly 50-50 into training and testing images. The images are available in JPG format alongside a dev kit file that contains all the labels for the images in the dataset.

Using the data available through this dataset I will apply deep learning techniques to train the model to recognize and successfully classify the car images in the testing dataset with a high level of accuracy and precision. I will first use Keras to build a neural network and optimize the network using the training data provided. Once the ideal performance in Keras is achieved, I will use TensorFlow to further optimize the weights and the hidden layers of the neural network to arrive at the best results that can be yielded from the car dataset.

This model will a versatile array of applications for many different necessities. It can be built into a mobile application that can work with cameras on phones to snap images and classify cars one may encounter on the road or parking lot. It could be used in conjunction with self-driving cars to be able to identify and understand the safety features on all cars it encounters on the road improving the security and safety of passengers inside the autonomous vehicle. It can also serve useful to traffic authorities in aiding the identification and classification of vehicles and provide substantial improvements in that field. It could finally also assist in the prospective second-hand car buyers to authenticate images listed from sellers to avoid being scammed. This project not only aims to teach something innately human, such as identifying objects like cars but use the strengths of a computer having a large training set to allow the model to identify the make, model, and year and go beyond and improve humans' ability to classify cars.

Dataset:

<https://www.kaggle.com/jutrera/stanford-car-dataset-by-classes-folder>