Machine Learning Engineer Nanodegree

Capstone Project Proposal

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13th July, 2020

Dog Breed Classifier

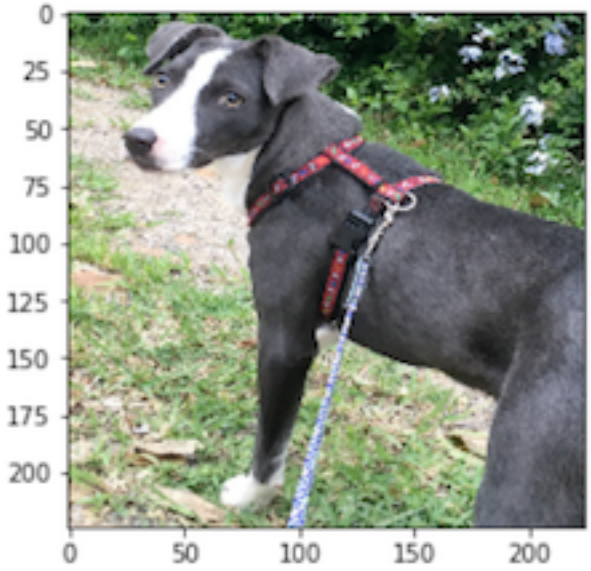
Domain Background

As part of Udacity's Machine Learning Nanodegree program, as a final project, I have chosen dog breed classifier problem which is well known in the machine learning community and can be found on Kaggle

Problem Statement

The aim of this project is to write an algorithm that could be used as part of a web application which is able to accept an image as input. If a dog is detected in the image, it will provide an estimate of the dog's breed. If a human is detected, it will provide an estimate of the dog breed that is most resembling. The image below displays potential sample output of this project.

```
hello, dog!
your predicted breed is ...
American Staffordshire terrier
```



Datasets and input

In this solution, the datasets are images of dogs and humans provided by Udacity.

Dog dataset

Human dataset

Solution Statement

I will use Convolutional Neural Networks (CNN) to implement an algorithm which is an ideal for analysing images and predict the dog breed. The CNN is a deep learning algorithm using transfer learning which takes image as input, analyse it and produce the predicted result.

Benchmark Model

As per the project goal, the solution should identify at least 6 out of 10 images (60%), however, I will try to do it 70% accuracy and will measure this percentage by using the test dataset.

Evaluation Metrics

Since out data is an unbalanced, simple accuracy calculation may not be sufficient. I will try to use the multi class log loss metrics to evaluate models.

Project Design

To produce the solution, I will be using the Convolutional Neural Networks (CNN) steps given in the notebook provided by Udacity nanodegree engineer program as follows:

- Step 0: Import Datasets
- Step 1: Detect Humans
- Step 2: Detect Dogs
- Step 3: Create a CNN to Classify Dog Breeds (from Scratch)
- Step 4: Use a CNN to Classify Dog Breeds (using Transfer Learning)
- Step 5: Write your Algorithm
- Step 6: Test Your Algorithm

References

Kaggle dog breed identification

Convolutional neural network