**Cat or Dog Classification**

# Using Neural Networks to Identify Common Pet Species

**Abstract**

My client is a website that helps store & organize pictures in a cloud-based server for thousands of photographers. Cats and dogs are the most popularly photographed, but also mislabeled, species. This is frustrating for consumers who are searching for specific subjects, as well as 3rd party data partners and advertisers trying to get a more accurate sense of a user’s content. The goal of this model is to increase dog/cat classification accuracy from 80% to 95%.

**Design**

The environment for this model was in Google Colaboratory to run Tensorflow & simultaneous GPUs. The data generators loaded the images in batches for the “homemade” Convolutional Neural Network, as well as for some transfer learning models with various optimizers, layers, and activation functions.

**Data**

Kaggle’s Cats vs Dogs dataset containing 25,000 training photos was leveraged for this project, as well as its 12,500 test images. Each set is evenly split between cats & dogs, and contains various poses, orientations, and photo qualities. Modeling this data would not have been possible without batch loading in Tensorflow.

**Tools**

* Tensorflow/Keras
* Matplotlib
* Seaborn
* Numpy
* Google Colab
* Pandas

**Findings**

* A simple Inception V3 transfer model was the most accurate, at 94%.
* The Convolutional Neural Network did a little bit better than the baseline non-Deep Learning Decision Tree model, but many variations of the transfer models did not.
  + Increasing the layers tended to overfit, and “elu” optimization was not effective for this dataset.

**Future Work**

Try:

* data augmentation practices (stretching, flipping, rotating),
* an RNN layer, and
* more transfer learning methods, such as AlexNet and GoogLeNet.

**Communication**

Slides will be available on my [Github](https://github.com/Franchalanche/MLE_Classification_Diabetes_Diagnosis).