



Image Classification for Dog Breeds

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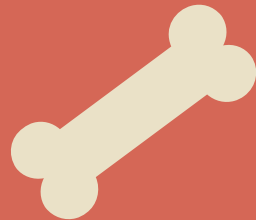


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Business Problem

In USA,
190 dog
breeds

Hard to
know them
all

Hard to
distinguish



Business Problem



OBJECTIVE

Use Neural Networks to take in images of dogs and classify their breed



IMPORTANCE

Rescue shelters

- ◆ Check for certain medical conditions based on breed
- ◆ Push adoptions for those with breed preference

Landlords

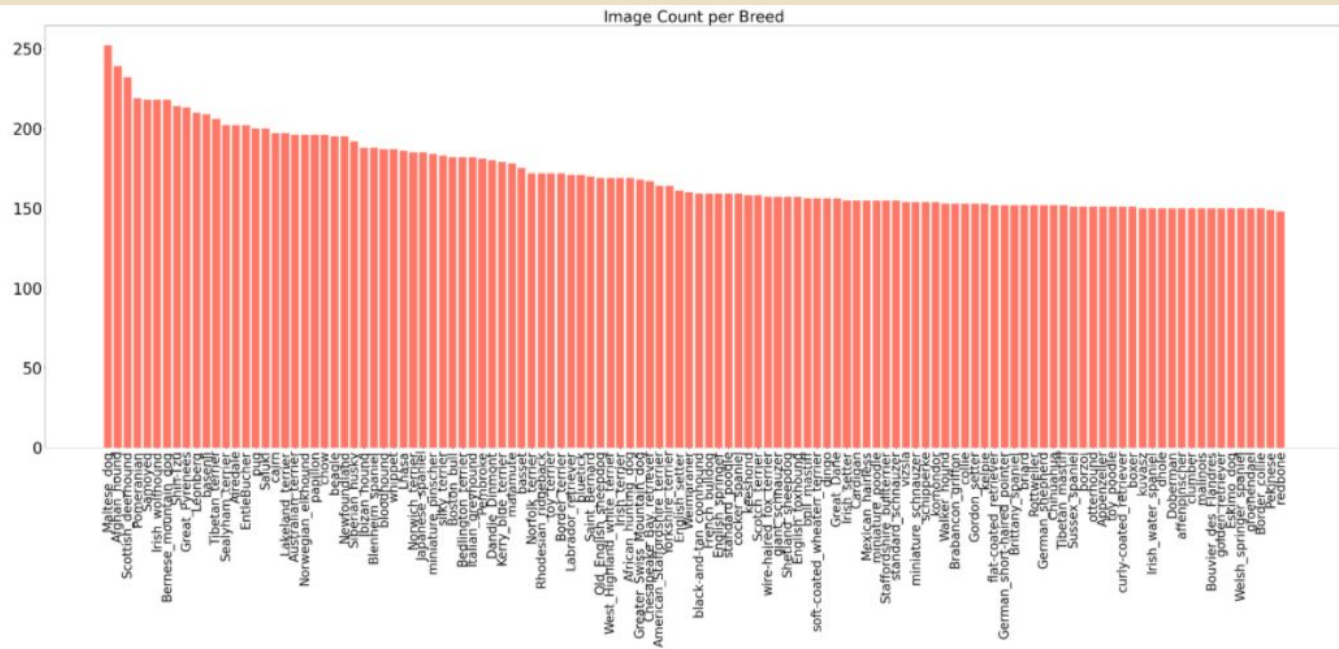
- ◆ Insurance purposes/ Certain breeds = bigger liability

Data

Stanford
Dog
Dataset
from Kaggle

20,580
images of
dogs

120
different
classes



Modeling



1

Data read in
and reshaped
to 256 by 256
pixels

2

Scaled data
using
Tensorflow
library

3

Passed in
Zoom and
horizonatal_flip
params

4

Modeled using
CNN models
and Transfer
Learning

Model Evaluation

→ Best model: InceptionV3

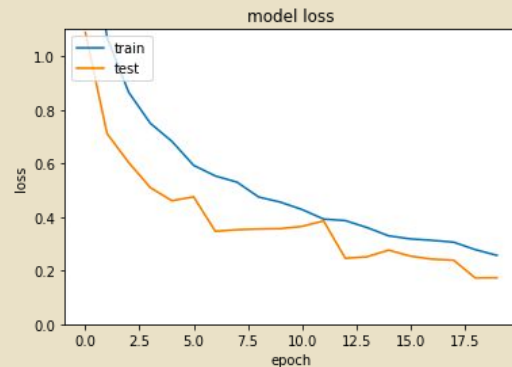
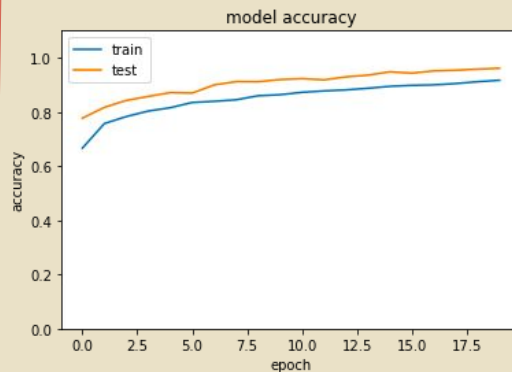
- ◆ Transfer learning
- ◆ pre-trained on millions of images

→ Architecture

- ◆ 9 layers
- ◆ batch normalization
- ◆ “relu” and “softmax” activation
- ◆ L2 Regularization (dropout .2 and .4)



	Train Accuracy	Test Accuracy
Model 1	2.44%	2.30%
Model 2	22.88%	32.22%
InceptionV3	91.68%	96.12%
ResNet50	5.37%	8.29%



Predicted: -Siberian_husky



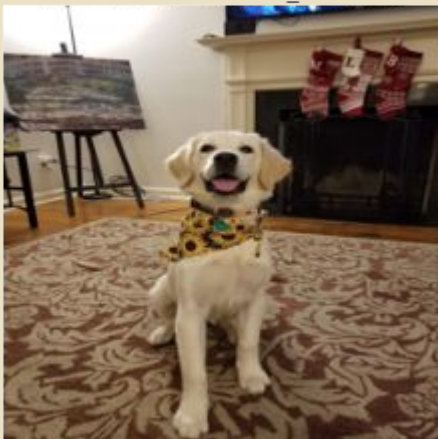
Predicted: -Samoyed



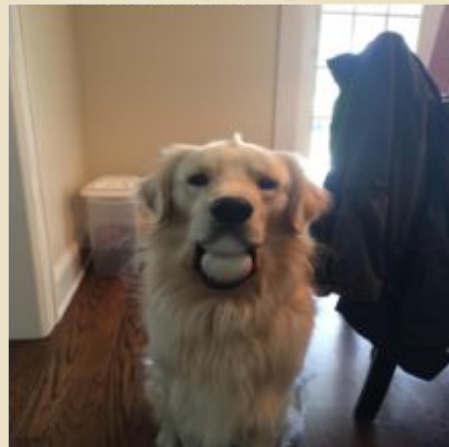
Predicted: -Chihuahua



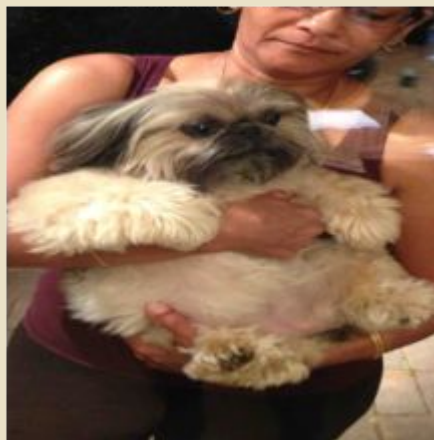
Predicted: -Labrador_retriever



Predicted: -golden_retriever






Predicted: -Shih-Tzu



Predictions on unseen data



Next Steps

-  Include images of mixed breeds within classes instead of just pure dog breeds (ex: cockapoo, pugle)
-  Create a recommendation system that recommends similar breeds based on input image
-  Build front-end for users to input image



Thank you!