Image Classification for Dog Breeds

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Business Problem

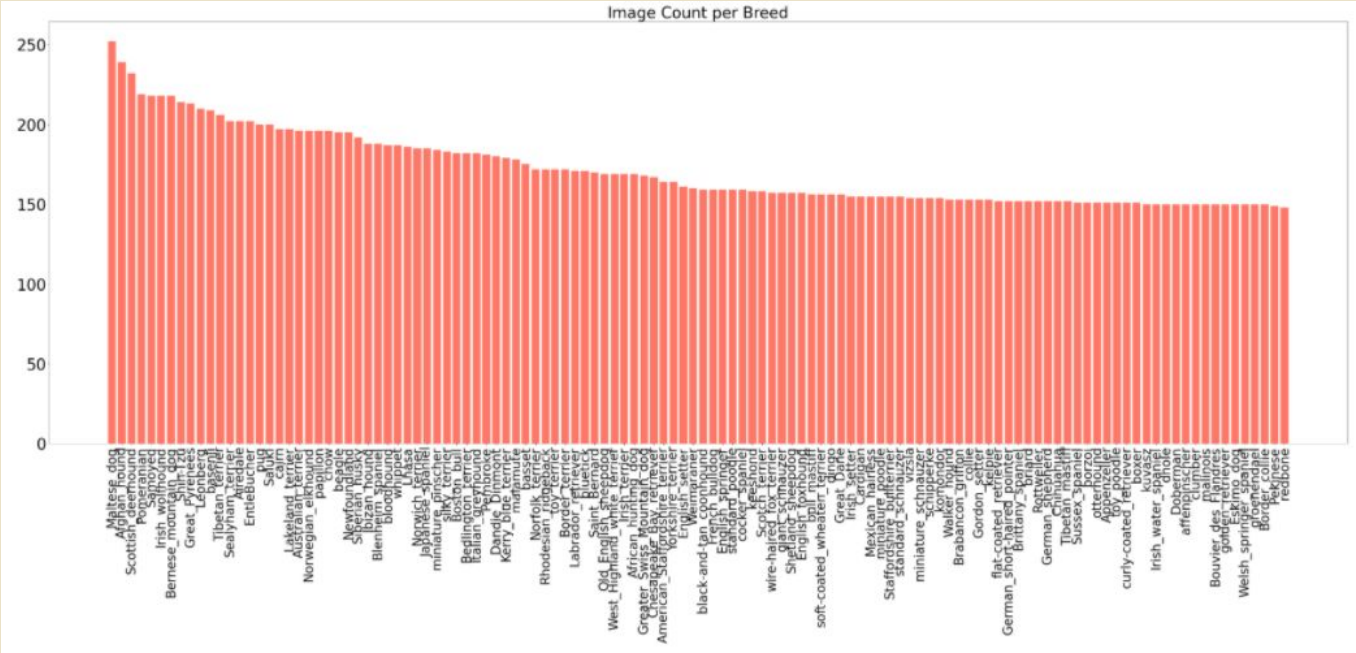
- In the United States, 190 different dog breeds
- Use Neural Networks to take in images of dogs and classify their breed
- Rescue shelters
  - Medical reasons
  - Push adoptions
- Landlords
  - Insurance purposes/ Damage
- Average Consumer
  - Curiosity
  - Interest

Data

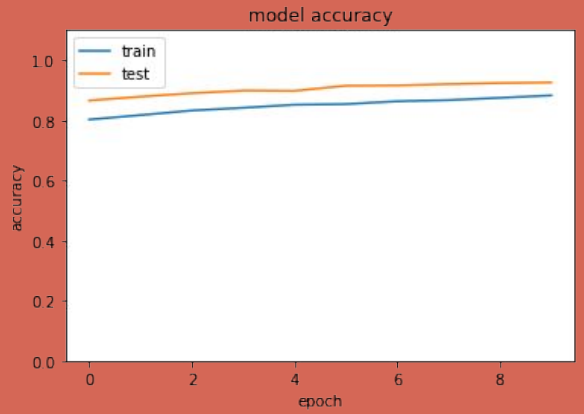
Stanford Dog Dataset from Kaggle

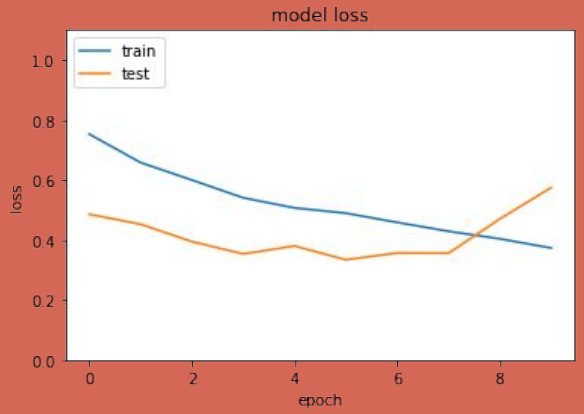
20,580 images of dogs

120 different classes



Modeling



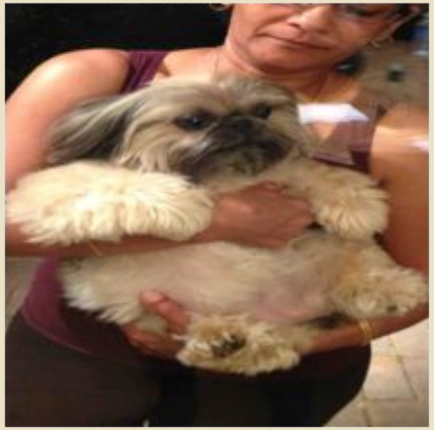


- ➔ Preprocessing: scaled to 0-1 range, zoom .2, horizontal_flip = True
- ➔ CNN models & Transfer Learning
- ➔ InceptionV3 is a CNN, pre-trained on millions of images
- ➔ 9 layers, batch normalization, “relu” and “softmax” activation, L2 Regularization (dropout .2 and .4)

	Train Accuracy	Test Accuracy
Model 1	2.44%	2.30%
Model 2	22.88%	32.22%
InceptionV3	86.24%	91.97%
ResNet50	5.37%	8.29%

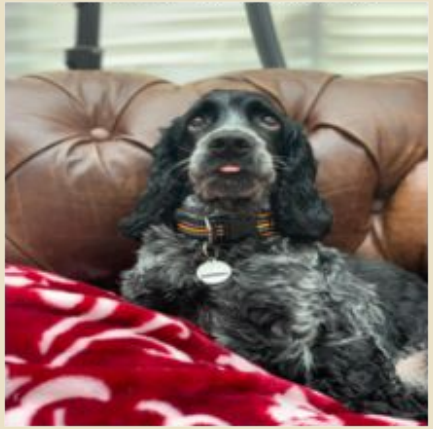
Predictions on unseen data

Predicted: -Shih-Tzu

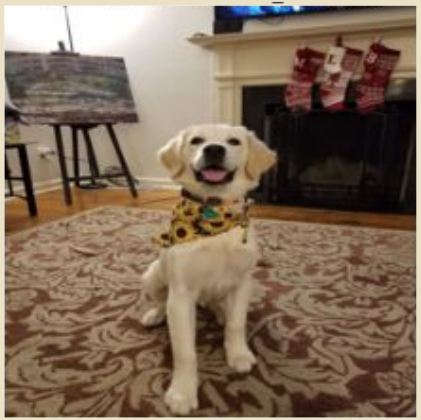


Predicted: -Chihuahua

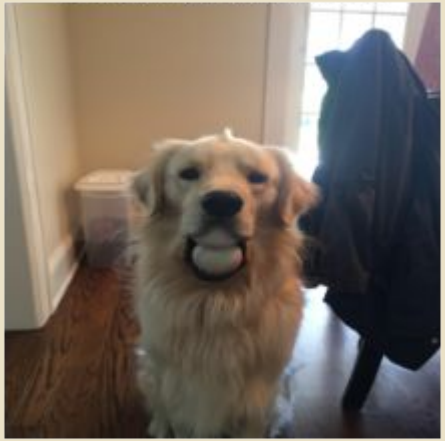
Predicted: -cocker_spaniel



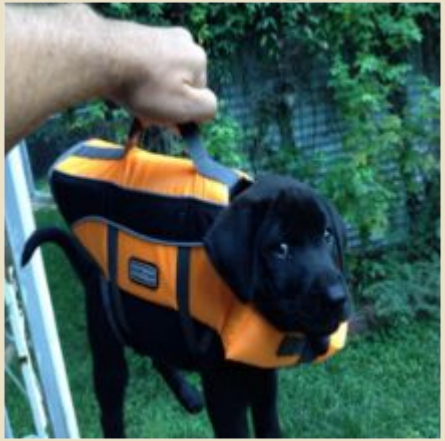
Predicted: -Labrador_retriever



Predicted: -golden_retriever



Predicted: -Labrador_retriever



Next Steps

- ➔ Include images of mixed breeds for the model to differentiate (ex: cockapoo, puggle)
- ➔ Create a recommendation system that recommends similar breeds based on input image
- ➔ Outputs characteristics of breed (ex: playful, intelligent, hypoallergenic, common medical issues, insurance liability)

Thank you!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