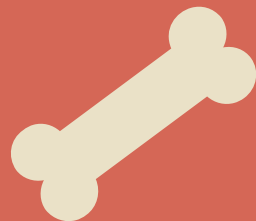




# Dog Breed Recognition System



Daniel Lin 06/20

Why?

# Dog Shelter Statistics

- 3.9 millions dogs end up at shelters every year
- 1 in 10 dogs adopted from shelters are return within 6 months
  - More expensive than anticipated
  - Destructive behaviors
  - Aggression
  - Barking
- Identifying the dog breed can help owners make better decision on which dog to adopt
  - Shedding
  - Hypoallergenic
  - Active
  - Territorial





Cardigan Welsh Corgi

VS



Portuguese Water Dog



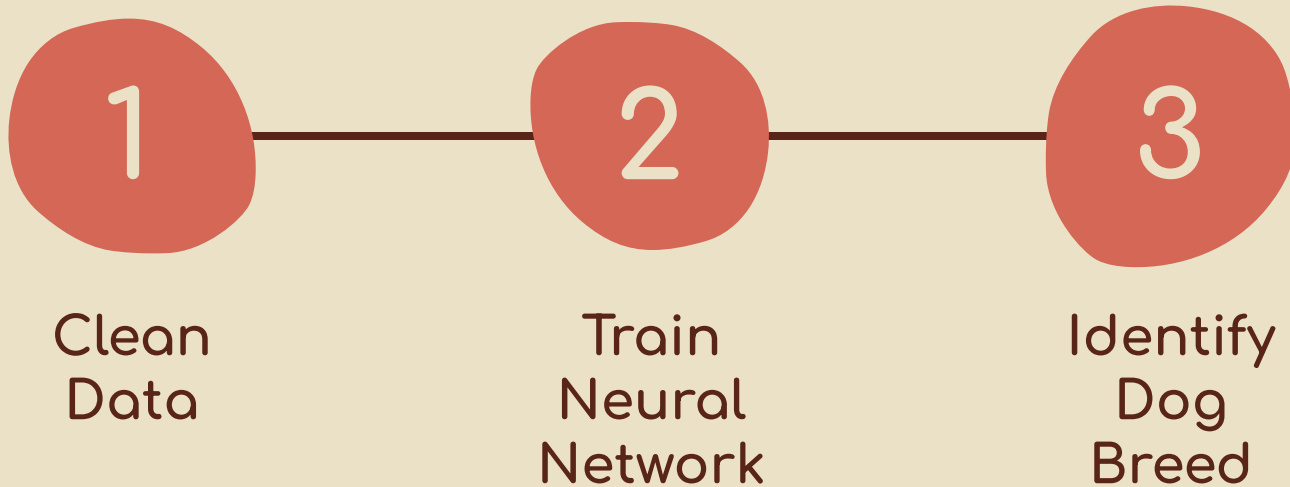
Boston Terrier

VS



Cavalier King Charles Spaniel

# Methodology



# The Dataset

- Dataset from Kaggle:
  - Contains photos of 133 dog breeds
  - Contains roughly 50 images per breed



Dandie Dinmont

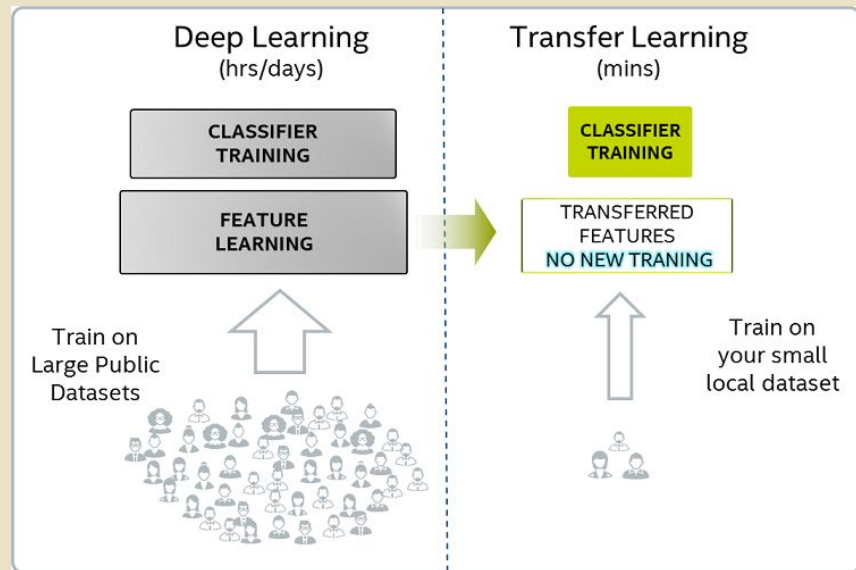


Great Pyrenees



# The Neural Network Architecture

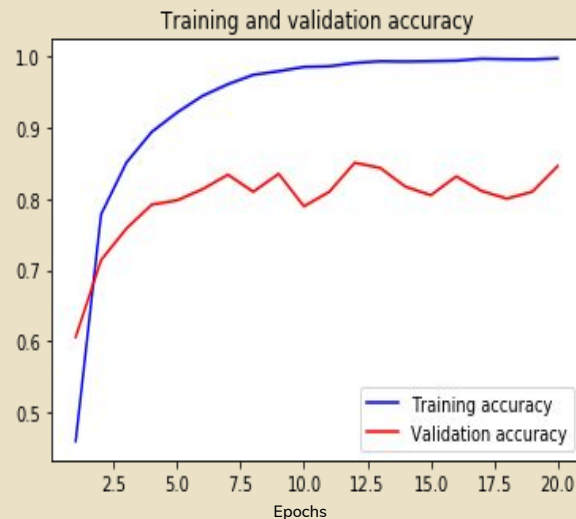
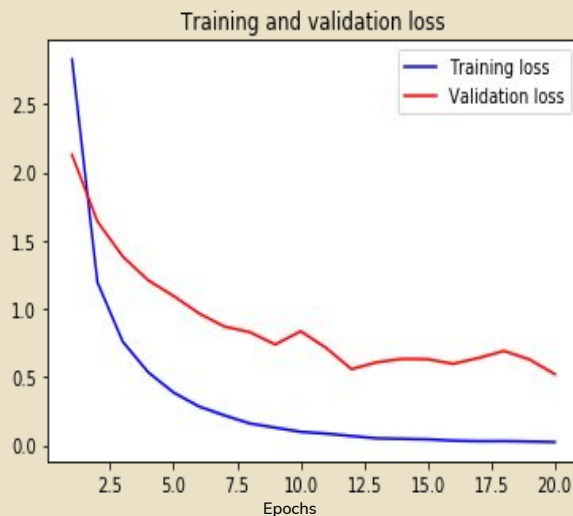
- Transfer Learning:
  - VGG19:
    - 19 layer deep CNN
    - Trained on more than 1mil images
  - ResNet50
    - 50 layer deep CNN
    - Trained on more than 1mil images
  - A combination of VGG19 and ResNet50





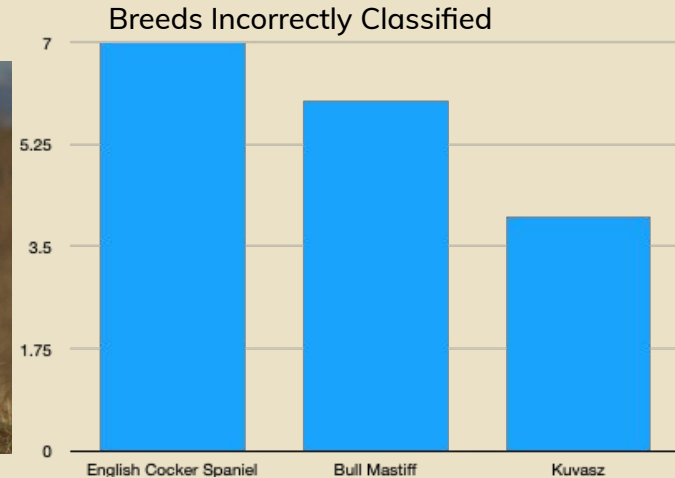
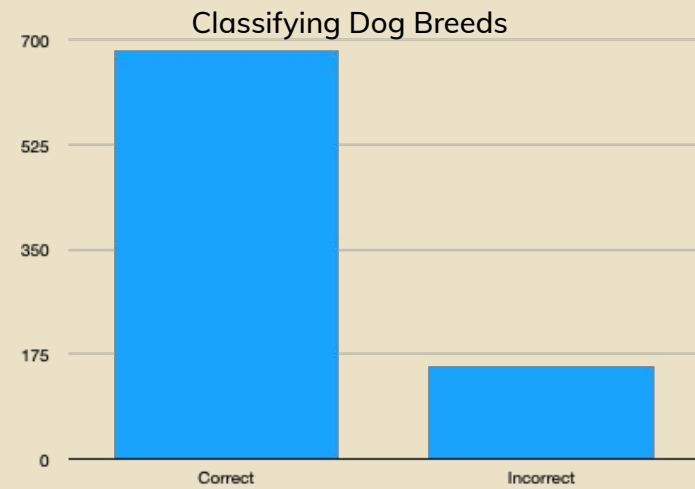
# Results

- Accuracy of 80.98%
- Overfitting on training data
  - Validation loss is greater than Training loss
  - Training accuracy is greater than Validation accuracy



# Results

- 155/836 images incorrectly classified
  - English Cocker Spaniel
  - Bull Mastiff
  - Kuvasz

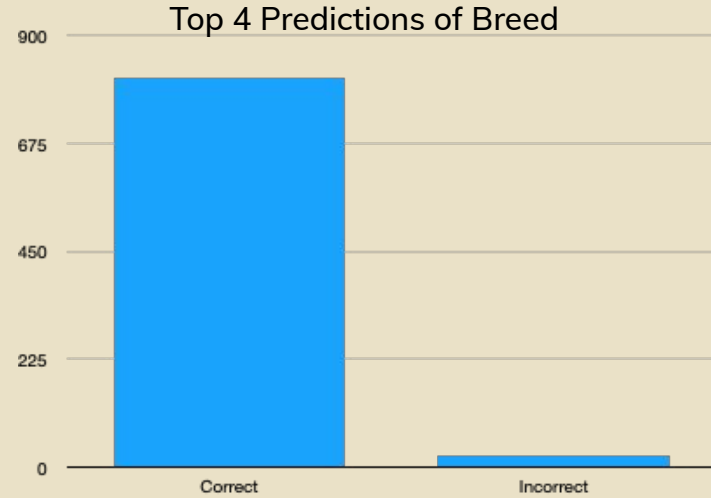


# Results

- Top 4 predicted results
  - 97% accuracy



Norwich Terrier



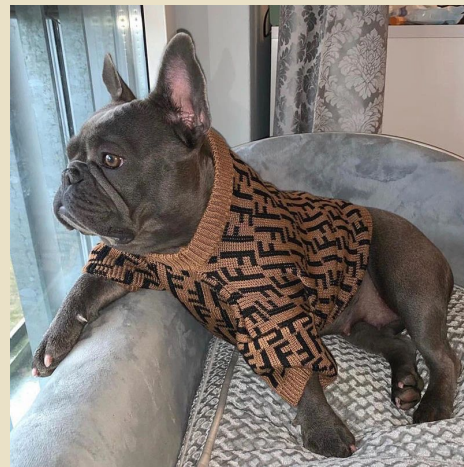
Cairn Terrier



# Future Work



- More clean data
- Try different models
- Cat breed recognition
- Disease recognition



# Thank you!

**Email:** [danman99551@gmail.com](mailto:danman99551@gmail.com)

**LinkedIn:** [daniel-lin91](#)

**Github:** [dlin91](#)

