Predicting Pawpularity Score

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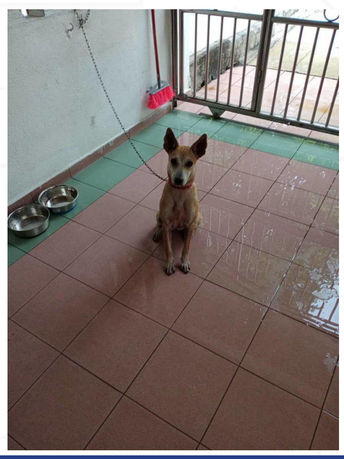


PetFinder.my

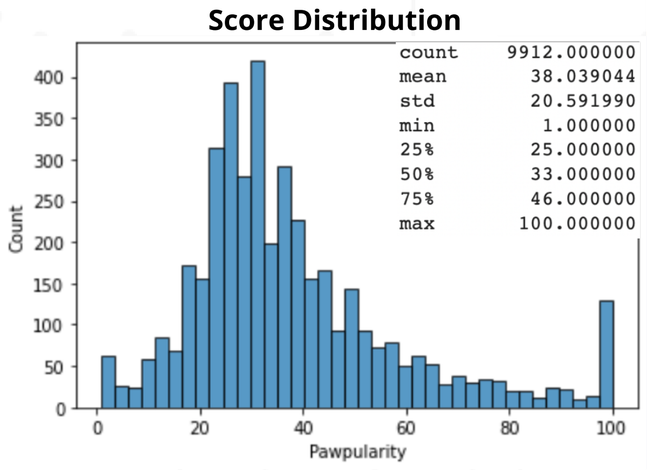
Homeless	Happy
21083	58401

Objective

- Create a ML model that processes images of pets and predict if the photo will be effective on a pet finder website
- The ML model takes an image of a stray animal and outputs either 'CUTE' or 'NOT CUTE'

Pawpularity score: derived from the statistics on the website (i.e. how many times the photo was clicked)

Score Distribution

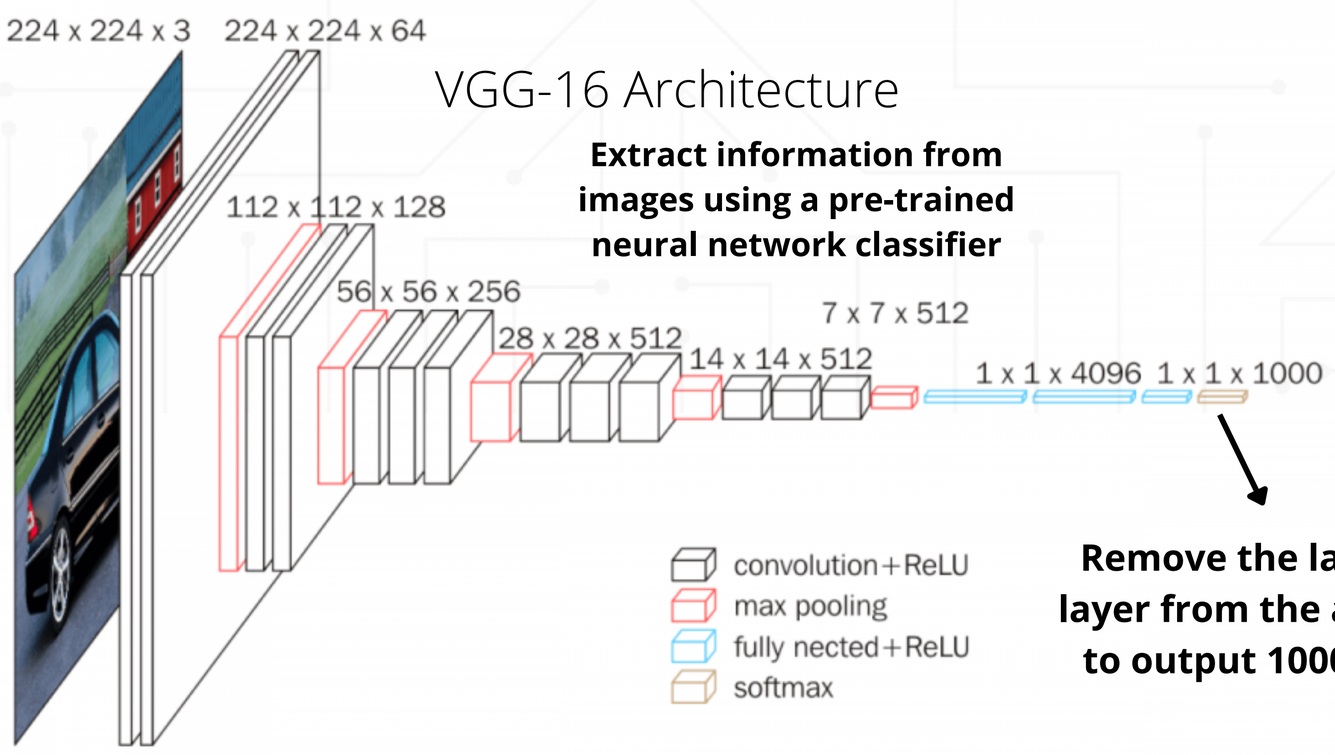


Considering the average Pawpularity score, in order to balance the dataset, we set the Pawpularity score bounds to be:
CUTE ≥ 33
NOT CUTE < 33

Methodology

- Simplify the problem by turning it into binary classifier ("Cute or not cute?")
- Use a (modified) pre-trained VGG-16 image classifier to extract 'features' from images
- Using the extracted 'features' as input, train a Support Vector Machine (SVM) to predict if the image is 'cute' or 'not cute'
- Then we compared it to another SVM model trained with manually labeled features provided by the websute

After being trained, SVM can accurately tell if the image is be attractive enough to do well on the pet finder website or not
Output: 'CUTE' or 'NOT CUTE'

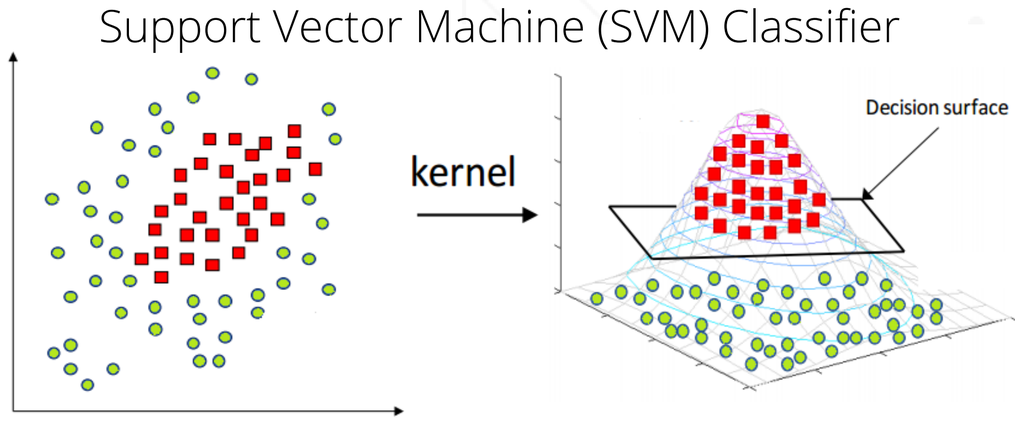


VGG-16 Architecture

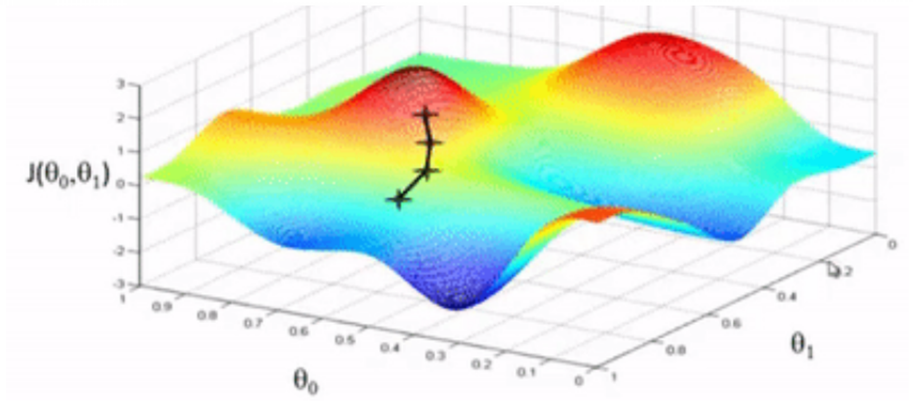
Extract information from images using a pre-trained neural network classifier

Remove the last SoftMax layer from the architecture to output 1000 'features'

Support Vector Machine (SVM) Classifier



Use the 1000 features extracted from images as inputs and train the SVM classifier



Results

- Overall, 70% accuracy for the model with deep-learning extracted features and 50% for the model with manually inputted features

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accuracy 0.5048   accuracy 0.7031
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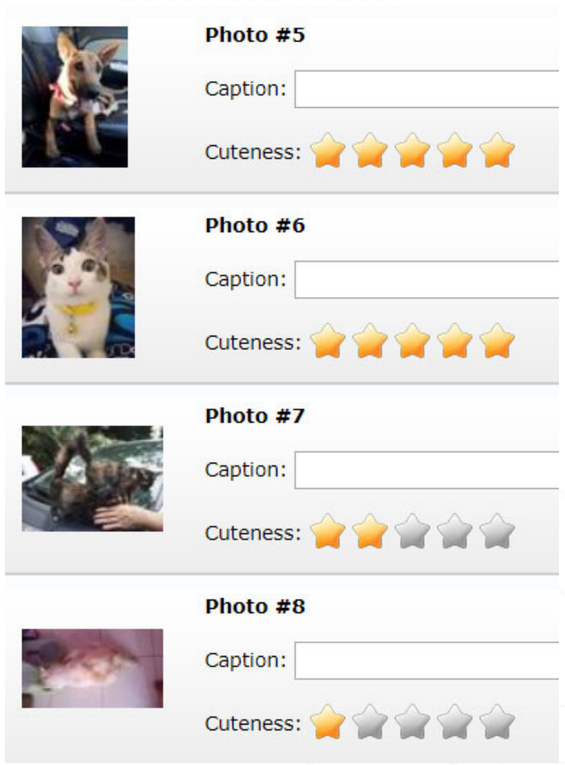
Cuteness-meter



Conclusion & Reflection

- Training SVM with human labelled data resulted an accuracy same as guessing
- Training SVM with deep-learning extracted features was far more accurate and more efficient
- It will be even better if we can convert the model into a regressor that predicts the Pawpularity score (outputting a more precise numerical value instead of a binary output).