Predicting Dog's Emotions By Machine Learning

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INTRODUCTION

Nowadays, there are plenty of machine learning projects focused on image recognition and caption generation. Great chunk of it is about recognizing human face and naming emotion it express. We decided to build image recognition with emotion capture, not for human faces though, but for dog's muzzles, as there is no good model to do that yet and far more fun.

IDEA ..!

• Use image recognition techniques to determine a dog's emotion from an image

• Predict the dog's emotion from facial expression information by using a pre trained machine learning model

PROCESS OVERVIEW

01 DOG EMOTION IMAGE DATASET

02 DOG KEYPOINT DETECTOR

03 PREDICTIVE MODEL

04 EXPLANATORY MODEL

DOG EMOTIONS IMAGE DATA SET

HAPPY

Trusted Partner (Owner), Playing, Food

ANGRY

Inaccessible Resource (Leash Aggressivity)

SLEEPY

After a good meal, during winter and at night.

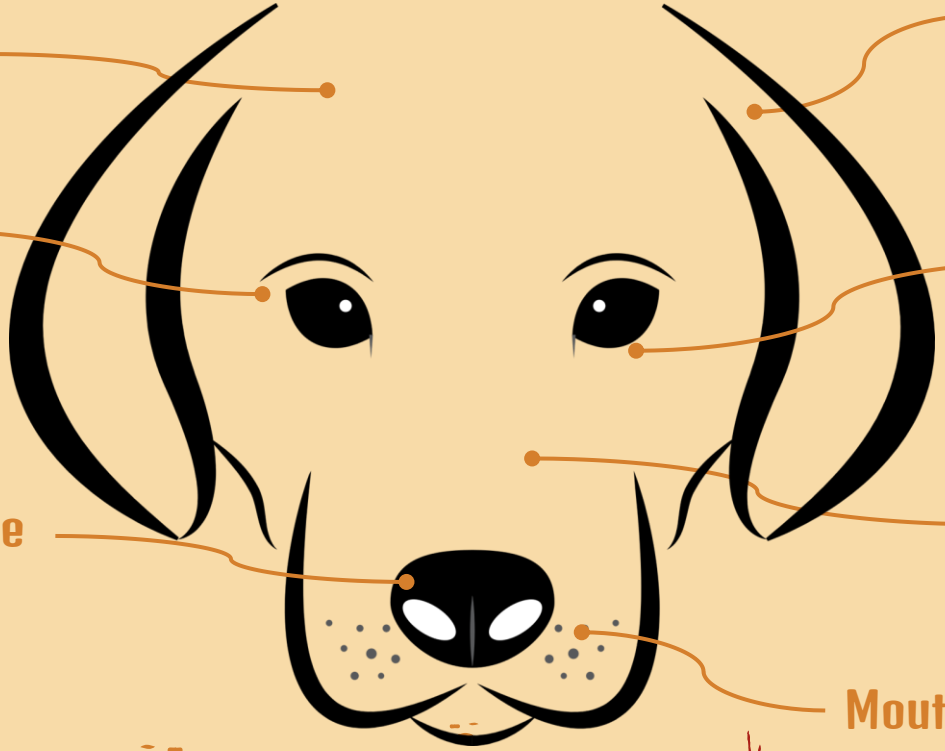
GOOD

Absence of any events and calm

OUR DATASET.

Emotion	Image example	No. of Images
Happy		500
Angry		500
Sleepy		500
Good Behaviour		500

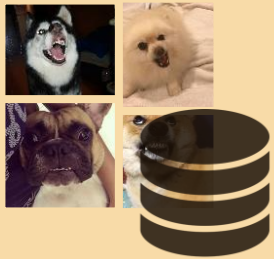
DOG KEYPOINT DETECTOR



PREDICTIVE MODEL

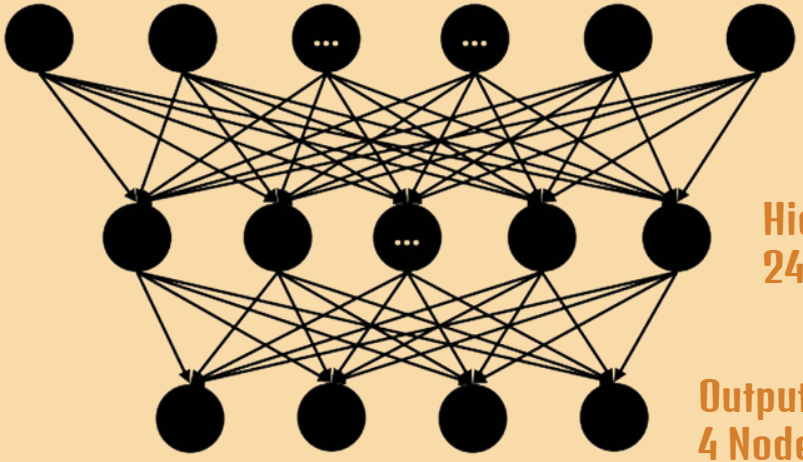
Small preprocessing

Pre-processed Emotion Dataset



Neural Network

Best NN of tested in Grid Search:



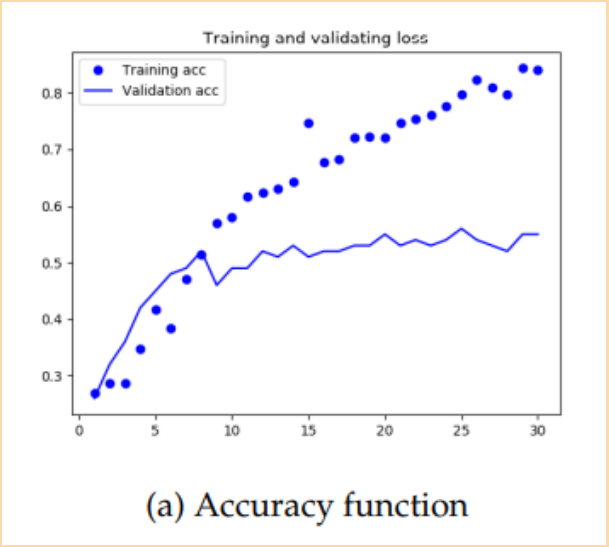
Input Layer:
48(Coordinate Values)

Hidden Layer:
24 Nodes

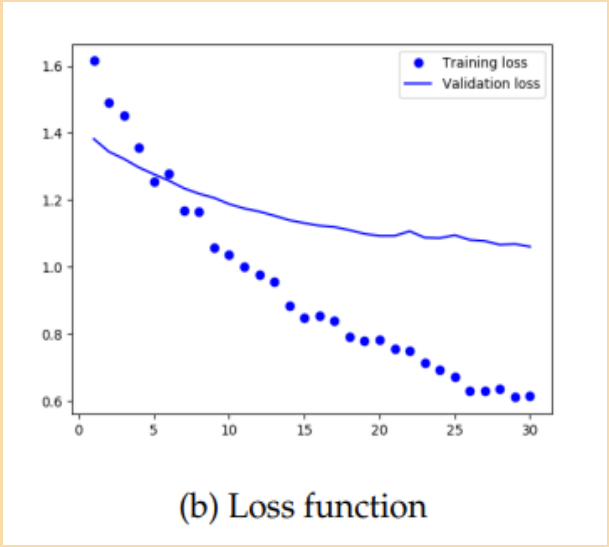
Output Layer:
4 Nodes (Emotions)

60% Accuracy on test set

EXPLANATORY MODEL



(a) Accuracy function



(b) Loss function

Accuracy and loss functions for CNN with 'imagenet'

CONCLUSION

The project shows promising results for machine learning dog emotion recognition, especially regarding the small size of the training data set. Multiple models were developed to determine a dog's emotional state based on input images with an accuracy between 56% and 60%.

THANK YOU !!