Dogs and Cats Classifier using Deep Learning

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INTRODUCTION

- Our project revolves about using deep learning techniques to classify the images of Cats and Dogs.
- Our classification system uses a Convolutional Neural Network (CNN), which takes an image as input, assigns weights and biases to each aspect of the image, and then uses that information to classify the image. We have used the Keras library for training the classifier. Upon completion of the training of the model, it will be able to differentiate between images of cats and dogs.

DATA

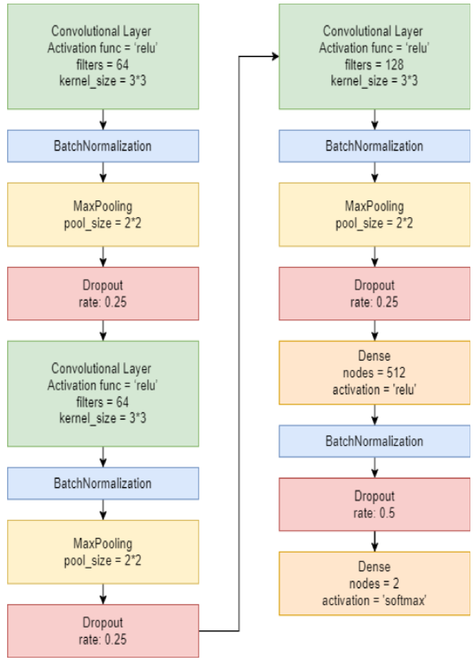
Data for training the classifier was taken from Kaggle, which has 25,000 images of dogs and cats in the training archive. This is a binary classification problem where the response variable is 0 and 1, i.e., 0 for cats and 1 for dogs.

ARCHITECTURAL DESIGN

Majorly four distinct kinds of layers are used in our project which are

- Convolutional
- Batch Normalization
- Max Pooling
- Dropout layers.

PROJECT ARCHITECTURE DIAGRAM



This shows the CNN architecture and hyperparameters for each layer used in the network.

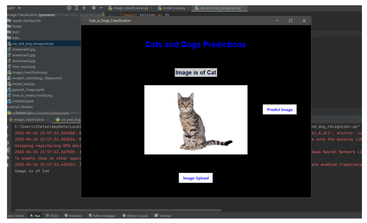
RESULTS

- It took 4414 seconds (1.2 hours approximately) to train the model on our system using Keras with python on a system configuration is Intel i7-8750H CPU @ 2.20GHz 2.21 GHz, 24 GB RAM. Operating System used is Windows 10.
- We tried to predict an image of a cat. Our model is able to predict this image accuracy with 72.95 percentage of accuracy. Using our training model we also created a frontend using the 'tkinter' library. After saving our training model we load it and use it to predict the image after loading it.

Training Model Time

```
This image is 72.95 percent cat
[0.729522 0.270478] cat
```

Prediction percentage of testing data.



Frontend using 'tkinter' using training data to predict the image of the uploaded file.

PYSPARK INSTALLATION AND SETUP OBSTACLES

- We wanted to create the same model as created above using pyspark as well but due to system configuration problems and library issues we were not able to create models in pyspark.
- We were able to install pyspark and its related dependencies but unfortunately, we were not able to install libraries required to create machine learning models like analytics-zoo and bigdl. Analytics Zoo is an open-source Big Data AI platform and includes the following features for scaling end-to-end AI to distributed Big Data. We were not able to find the version that satisfies the requirements.
- Therefore, we could not able to compare the time to train the model and its performance with pyspark from python.

CONCLUSION

- We were able to train our model in 4414 seconds (1.2 hours approximately). This took a lot of time which can be solved with the help of pyspark. Unfortunately, we were not able to transfer
- Our model is able to classify cats and dogs successfully. We tried to predict an image of a cat. Our model is able to predict this image as a cat with an accuracy of 72.95 percentage of accuracy.

REFERENCES

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