Report

On

Cat - Dog image classification

Submitted by

Akankshi Priya

11712312

Roll no.21

School of Computer Science & Engineering
Lovely Professional University, Phagwara

(April, 2020)

Introduction:

In this project our aim is to classify the image given by the user is a cat or a dog image. The image given by the user will be analysed and predicted result will be given as output. Convolutional Neural Network is used to classify the image. This model is trained on more than 25000 data and tested also. This model predicts the output with 93.41% accuracy. I got this accuracy in 10th iteration and data loss of 16.62%.

Conceptual Framework:

Libraries used in this project:

Keras: Keras is TensorFlow's API for building and training deep learning models. In this model we are using sequential model. Sequential model is used to build a simple, fully-connected network.

Dense: A dense layer is just a regular layer of neurons in a neural network. Each neuron receives input from all the neurons in the previous layer, thus densely connected.

Dropout: A Simple Way to Prevent Neural Networks from Overfitting.

Flatten: Flatten is used in this model to convert the input array in 1D.

Activation: The activation function used in this model is relu. Activation function defines the output.

Conv2D: This layer creates a convolution kernel that is convolved with the layer input to produce a tensor output.

Maxpooling2D: Max pooling operation for spatial data.

TensorBoard: TensorBoard provides the visualization and tooling needed for machine learning experimentation such as loss and accuracy.

Pickle: Python pickle module is used for serializing and de-serializing a Python object structure.

OpenCV: OpenCV-Python is a library of Python bindings designed to solve computer vision problems.

cv2.imread(): cv2.imread() method loads an image from the specified file. If the image cannot be read (because of missing file, improper permissions, unsupported or invalid format) then this method returns an empty matrix.

Model Implementation:

Data: In this model more than 25000 images of cats and dogs are used as training data. The data used in this project is available at https://www.microsoft.com/en-us/download/confirmation.aspx?id=54765

Input: Model asks the user to give the full path of the image which user wants to test.

Processing: The model is trained on a large data. Firstly, the image provided by the user is converted into array with 100*100 pixel. If coloured image is given, it is converted to Gray for simplification. This array is given to the model. After this, model predicts the output on binary classification using sigmoid activation function in output layer.
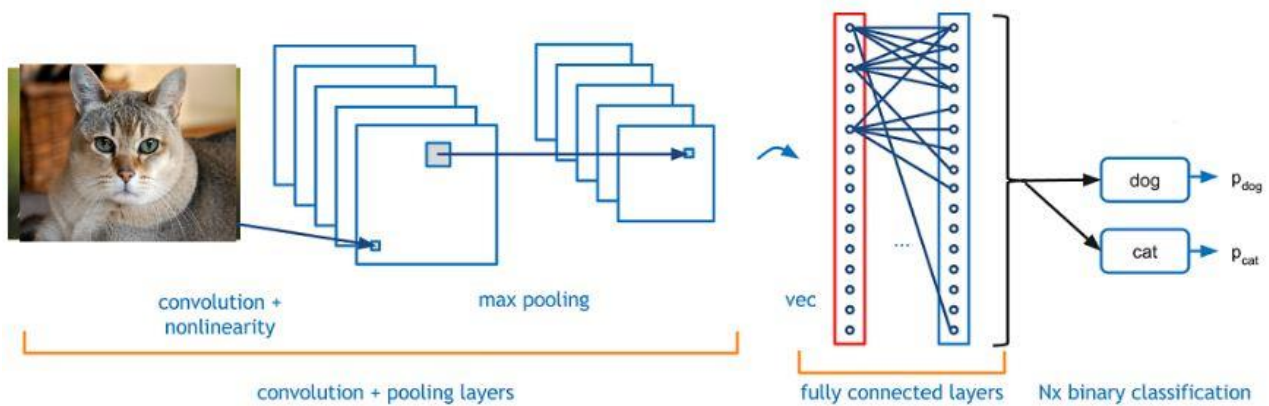
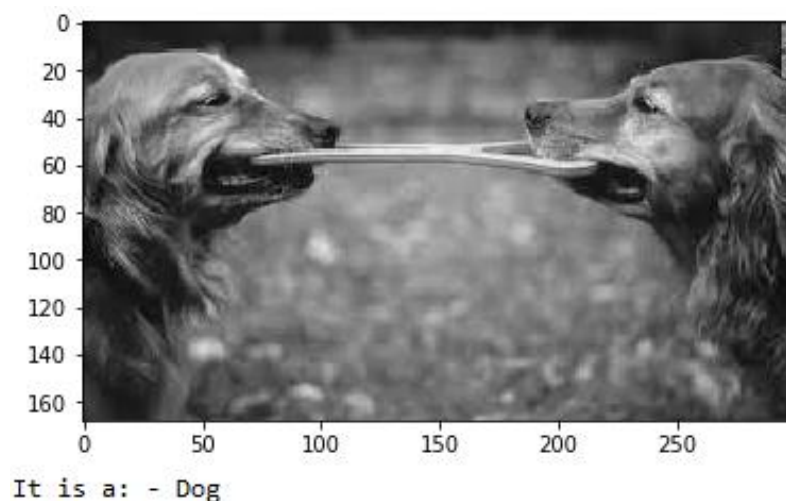**Output:** Model gives the predicted output in 0 and 1. 0 is for Dog and 1 is for cat.

Verification of Model:

INPUT:

```
In [9]: runfile('E:/Project/classification_image.py',
wdir='E:/Project')

Enter the path of image to classify
C:\Users\Akankshi Priya\Desktop\images.jpg
```

OUTPUT:

It is a: - Dog

Applications:
This project gives a general idea of how image classification can be done efficiently. The scope of the project can be extended to the various industries where there is a huge scope for automation, by just altering the dataset which is relevant to the problem.