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Familiarizing with the Concept of Neural Networks: Reflective Journal

Introduction

In this report, I share my experience performing a Lab using VGG16, a renowned deep learning model designed for image recognition. Utilizing Google Colab for the lab, I was introduced to the fundamentals of computer vision with no need for complex coding. The primary aim was to comprehend the workflow involved in applying an image classification model.

Reflection

The journey commenced by importing crucial libraries, including TensorFlow, Matplotlib, and ipywidgets, into Google Colab. Subsequently, VGG16, which had been pre-trained on the ImageNet dataset – an extensive image database specifically crafted for object recognition software research, was loaded. This step enabled an in-depth exploration of the model's architecture, offering insights into its diverse layers, their classifications, output dimensions, and parameter counts.

Having established a designated function for image loading and preprocessing, I proceeded to evaluate the model using a dog image supplied by the professor. While VGG16 successfully recognized the image as depicting a dog, its performance in identifying the specific breed left room for improvement. Instead, the model made a different breed prediction with a confidence level of 34%.

```
1/1 [=====] - 1s 1s/step
Downloading data from https://storage.googleapis.com/download.tensorflow.org/data/imagenet\_class\_index.json
35363/35363 [=====] - 0s 0us/step
[('n02097474', 'Tibetan_terrier', 0.34107143), ('n02091635', 'otterhound', 0.18327044), ('n02102318', 'cocker_spaniel', 0.14160475)]
```

Continuing with the prediction, the model once more erred in its predictions, erroneously classifying a whale as a great white shark with a high confidence level of 90%. This discrepancy underscored a noteworthy aspect for potential enhancement within the model's training dataset, particularly the need to augment its diversity and volume of animal imagery.



```
load (1)
```

```
Prediction
```

```
=====] - 1s 737ms/step  
4850', 'great_white_shark', 0.906933), ('n01491361', 'tiger_shark', 0.040974826), ('n01494475', 'hammerhead', 0.03
```

Conclusion

In conclusion, this lab experience using VGG16 within the Google Colab environment provided valuable insights into the practical application of deep learning models for image recognition. While VGG16 demonstrated its capability to recognize general objects and even specific categories like 'dog,' the limitations in accurately identifying breeds and distinguishing between similar animal species became evident. This experience emphasized the importance of a robust training dataset, suggesting that for improved performance, efforts should be directed towards diversifying and expanding the dataset to encompass a wider range of animal imagery.