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First Interaction with VGG16, a Deep Learning Model: Reflective Journal

Introduction

In this report, I share my firsthand experience with VGG16, a renowned deep learning model designed for image recognition. Utilizing Google Colab for the lab, I was introduced to the fundamentals of deep learning in a user-friendly environment, eliminating the need for complex coding. The primary aim was to comprehend the workflow involved in deploying a deep learning model, including data preprocessing and interpreting model predictions.

Reflection

The journey began with importing essential libraries such as TensorFlow, Matplotlib, and ipywidgets into Google Colab. VGG16, pre-trained on the ImageNet dataset, a comprehensive image database designed for object recognition software research, was then loaded. This step allowed me to delve into the model's architecture, providing insight into the various layers, their types, output dimensions, and number of parameters.

With a defined function for image loading and preprocessing, I tested the model with a macaw image, an emblematic bird of South America. Impressively, VGG16 identified the macaw with a staggering 99.6% confidence, showcasing its robustness in image classification.

Further testing images of a dog and a kangaroo, the model successfully recognized the dog with 97.7% confidence, illustrating its adeptness at breed identification. Conversely, the kangaroo posed a challenge, being incorrectly classified

Model: "vgg16"		
Layer (type)	Output Shape	Param #
=====		
input_1 (InputLayer)	[(None, 224, 224, 3)]	0
block1_conv1 (Conv2D)	(None, 224, 224, 64)	1792
block1_conv2 (Conv2D)	(None, 224, 224, 64)	36928
block1_pool (MaxPooling2D)	(None, 112, 112, 64)	0
block2_conv1 (Conv2D)	(None, 112, 112, 128)	73856
block2_conv2 (Conv2D)	(None, 112, 112, 128)	147584
block2_pool (MaxPooling2D)	(None, 56, 56, 128)	0
block3_conv1 (Conv2D)	(None, 56, 56, 256)	295168

as a hartebeest with approximately 70% confidence. This discrepancy highlighted a potential area for improvement in the model's training dataset, particularly in enhancing the diversity and volume of wildlife imagery.

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Upload (2)
Make Prediction
1/1 [=====] - 1s 544ms/step
[('n02099712', 'Labrador_retriever', 0.9775327), ('n02099601', 'golden_retriever', 0.014062086), ('n02089973', 'English_foxhound', 0.0023339249)]
1/1 [=====] - 1s 850ms/step
[('n02422106', 'hartebeest', 0.6944959), ('n02422699', 'impala', 0.2365221), ('n02423022', 'gazelle', 0.061767355)]

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Conclusion

Engaging with the VGG16 model was an enlightening introduction to the field of deep learning. It demystified the operational aspects of a sophisticated image recognition model and underscored the importance of comprehensive and varied datasets in improving model accuracy. This experience has significantly enriched my understanding of deep learning applications and has sparked further interest in exploring this innovative technology.