MINI PROJECT

(2020-21)

IMAGE CLASSIFICATION

SYNOPSIS

Institute of Engineering & Technology

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Acknowledgment

It gives us a great sense of pleasure to present the synopsis of the B.Tech Mini Project (IMAGE CLASSIFICATION) undertaken during B.Tech IIIrd Year. This project in itself is going to be an acknowledgement to the inspiration, drive and technical assistance will be contributed to it by many individuals.

We owe special debt of gratitude to Mr. Pankaj Sharma, Faculty Department of CEA, for providing us with an encouraging platform to develop this project, which thus helped us in shaping our abilities towards a constructive goal and for his constant support and guidance to our work. His sincerity, thoroughness and perseverance is been a constant source of inspiration for us. We believe that he will shower us with all his extensively experienced ideas and insightful comments at different stages of the project & also taught us about the latest industry-oriented technologies.

We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind guidance and co-operation.

INTRODUCTION

Image classification refers to a process in computer vision that can classify an image according to its visual content. For example, an image classification algorithm may be designed to tell if an image contains a human figure or not. While detecting an object is trivial for humans, robust image classification is still a challenge in computer vision applications.

Since I'm a newcomer to this issue, My goals were to understand how the model works, describe it; customize the model and train it to recognize photos.

Implementation Details

To create such model, it is necessary to go through the following phases:

- Model construction
- Model Training
- Model testing
- Model Evaluation

Model construction depend on machine learning algorithms. In this project case, it was neural networks. Such an algorithms looks like:

- Begin with its object: model = Sequential()
- then consist of layers with their types: model.add(*type_of_layer()*)
- After adding a sufficient number of layers the model is compiled. At this moment Keras communicates with TensorFlow for construction of the model. During model compilation it is important to write a loss function and an optimizer algorithm.
- It looks like: model.compile(loss= name_of_loss_function", optimizer= name_of_opimazer_alg")
- The loss function shows the accuracy of each prediction made by the model.

Before model Training it is important to scale data for further use. After model construction it is time for model training. In this phase, the model is trained using training data and expected output for this data.

Motivation

Many people say that today"s college students have it easy. All information they need is at their fingertips, so they can easily complete all academic projects after browsing the Internet for a few hours. However, that"s not what happens in reality. The curriculum have become more rigorous than ever, so college students have to think of different ways on increasing their productivity and motivation.

Future Prospects

As we move towards the mid-21st century, it's indisputable that Deep Learning is going to become increasingly important. Deep learning (DL) became an overnight "star" when a robot player beat a human player in the famed game of AlphaGo. Deep learning training and learning methods have been widely acknowledged for "humanizing" machines. Many of the advanced automation capabilities now found in enterprise AI platforms are due to the rapid growth of machine learning (ML) and deep learning technologies.

Well, to be honest, we cannot really tell what will happen in the future. As scientists, we can only analyze our past and discover some patterns about how something had happened before, and what is the likelihood of happening something in the future.

Requirements

a) Hardware:

- Processor: Intel dual core or above
- Processor Speed: 1.0GHZ or above
- RAM: 1 GB RAM or above
- Hard Disk: 20 GB hard disk or above

b) Software:

- Language: Python
- Framework: Keras
- Libraries: Numpy, Matplotlib
- Programming Language
  - ❖ PYTHON

References

- **https://keras.io/**
- **www.medium.com**
- **www.towardsdatascience.com**
- **https://www.youtube.com/**

- **Faculty Guidelines**
  i) Mr. Sharad Gupta Sir
  ii) Mr. Pankaj Sharma Sir