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OBJECT DETECTION AND DATA CLASSIFICATION WITH DEEP LEARNING MODEL USING TENSORFLOW

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ABSTRACT: Deep learning is the sub set of machine learning in artificial intelligence. The major role is played in deep learning is analysis the inner function of the object and make effective decision. Deep learning achieves higher success results in many applications and can provide faster results in data analytics process. Object has more number of patterns and geographical movements. Analysing these pattern we need effecting classification method with maximum efficiency and minimum processing time. In this paper, we used TensorFlow for detecting object from real time video stream data. This neural network model and create data pattern for each objects. TensorFLow MNIST dataset is used data classficiation and analytics process. This library files are developed my Google. The multiple actions and classification techniques are analysed. The experimental results are analysed with liner unit, softpuls, softsign and convolution neural network. The result shows that more accurate and objects detection using TensorFlow.

KEY WORDS: Deep Learning, TensorFlow, Object Detection, Data Classification, Data analytics

I. INTRODUCTION

The GPS is used to track human objects and track chip is used to measure the accuracy. Objects are connecting with GPS chip and analysing the record is tedious process. So we need to replace instead of GPS some other components such as IoT enabled services. Camera module is embedded with raspberry pi devices. It can capture the object and apply machine learning algorithm to analyse the results. Neural networks are used to process massive dataset and optimization is applied for creating data models [1].

TensorFlow framework is available for processing deep learning model or deep convolutional network. MobileNet, SSD Modes and TenseMod are predefined dataset available in TensorFlow [2]. The API is used to detect objects from real time video streams. The base and fine tuned process is applied for measuring range of objects and keeps track object performance. This is multi tendency model so deep learning method is applied for both data classification and analytics [3]. Big data is used for processing large data set with divers and complex data structures. To analyze traditional and conventional approaches are difficult and wide spread of internet usage is affect the performance. Nowadays, the usage of medium and data can varies and huge amount unstructured dataset are used. The data production such as photo, audio, video, text and logs with resulted information are called Big data [4].

The convolution neural network model is proposed to enable changing parameters and apply classification techniques to analyze the data. There are several data set and libraries are available in deep learning studies [5]. TensorFlow is open source library system developed by Google for statistical and data analytics process. It provides interface for applying machine learning and data analytics. This paper classified as following sections, section 2 describes related works, section 3 describes deep learning and data classification models, section 4 explains implementation and discussions, section 5 gives conclusion and results.

II. RELATED WORKS

Deep learning is popular method and it is learning model for artificial neural network. Wong et al, classical machine learning approaches are used 0 and 1, deep learning is providing result between 0 to 1 range. This method gives more

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accurate, classical results and decision making. The same manner machine learning approaches are used in big data analytics, deep artificial neural networks and expert system applications [6].

Faith et al, TensorFlow can be used for wide range of heterogeneous system, mobile devices and distributed applications. The various GPUs and cards are used for computation and hundred machines are in processing data set. MNIST data set is provided by National Institute of technological science for UK and large data set is used for trained data processing. The various image processing techniques is available to process handwritten and capture images [7].

The following are advantages of TensorFlow proposed by Rasika et al. [8] TensorFlow is ease of use and API for implementing programming model such as C++, Python, etc. It better support for implementing GPU computing. It is providing high level API modelling. It is supported for conventional and extreme dataset [9].

III. OBJECT DETECTION AND DATA CLASSIFICATION

For the dataset 50,000 images are trained from 10,000 figures. The figure 1 shows that handwritten picture representation of 32X32 pixels.

Figure 1 32X32 pixel data set

The data classification is applied for dataset and TensorFlow is prepared activation function. The activation function is used to measure the data and find the each object residue.

x is represented as input coordinate value,

where the sigmoid(x) = $(1 / (1+ e^{-x}))$, softplus = $\ln(1+e^{x})$ and softsign = $1 / |1+x|$)

The above three function is important factor for classification. Based above representation the object detection and data classification has following steps,

The supervised deep learning classification has 1). Dataset has minimum of 100 images for each object, 2). Training data is created for detecting objects, 3). Fine tuned object detector is applied for measuring the efficiency. Softsign classifier is used for classifying dataset and function is selected for deep learning model. TensorFlow is used for calculating sigmoid, softplus and softsign values. The flow diagram is shown below figure 2. The images are stored in IDX file format and MNIST dataset is created. The multi dimensional matrices of various digital types are in dataset modelling. Each dataset has label, image, file format and representation.

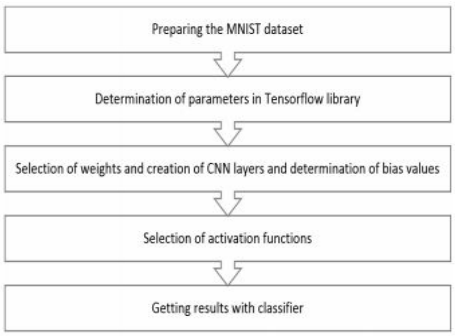

Figure 2 Data Classification flow

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The weight of the convolution layer is 5x5 and 32bit output is selected. This is fully connected layer so 5000 images are selected as 1024bit plane. The output layer has total number classes with repect to input bias.

Object detection and data classification includes track, convergence and values. As per the requirements efficient pattern detection is applied for each behaviour characteristics measurement. This method provides effective way of identifying pattern and geo graphic mining for aggregation. The relative motion framework is developed for managing group entities, directions and changes. The collection of spatial, temporal and similarity pattern are classified based on tracking algorithms.

IV. EXPERIMENTAL SETUP

The fine tuning process is applied for each relative frame based on existing feature. The following steps are carried out for processing objects a. Preparing training dataset, 2. Resizing and requirement gathering, 3. Generate XML file for objects, 4. TFR record created for XML files, 5. Setting configuration file for each model, 5. Train the model using TensorFlow.

A brief overview of fine-tuning the pre-existing model with respect to custom objects is given below: [5] 1. Prepare a training dataset. This data is a large collection of images resized as per the requirement. 2. Crete an XML file that describes the objects in the pictures. This is called as labelling. 3. Convert all the XML files to TFRecord files. 4. Setting up the configuration file for the model. 5. Train the model by using the TFRecord files of the images and the configuration file.

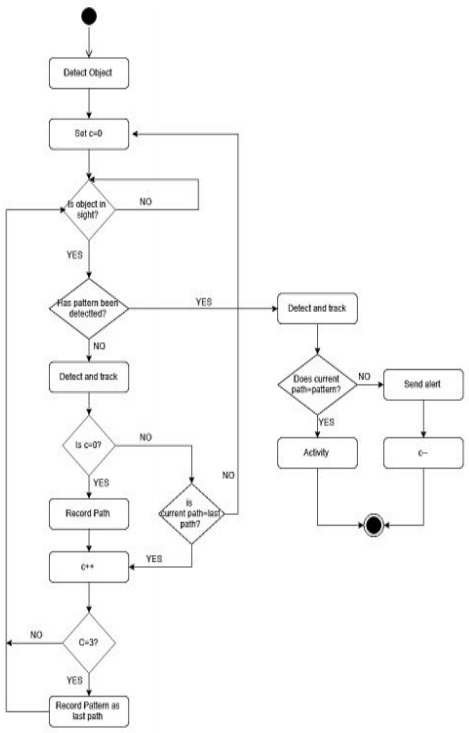

Figure 3 TensorFlow Train to Train model

For above case , the object has 3 levels of information such as labal, instance and logs. The tracking of each object is receiving an alert information and request. The following table shows that the comparative analysis of TensorFlow with other results.

Characteristics	Tourch	Caffe	TensorFlow
Languages	C++	C++	Python
Pretrained	No	Yes	Yes (Inspection)
GPU	OpenGL	OpenGL	CUDA
RNN	No	Yes	Yes

Table 1 Comparison of TensorFlow with existing models

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The TensorFlow activation function results are shown in below

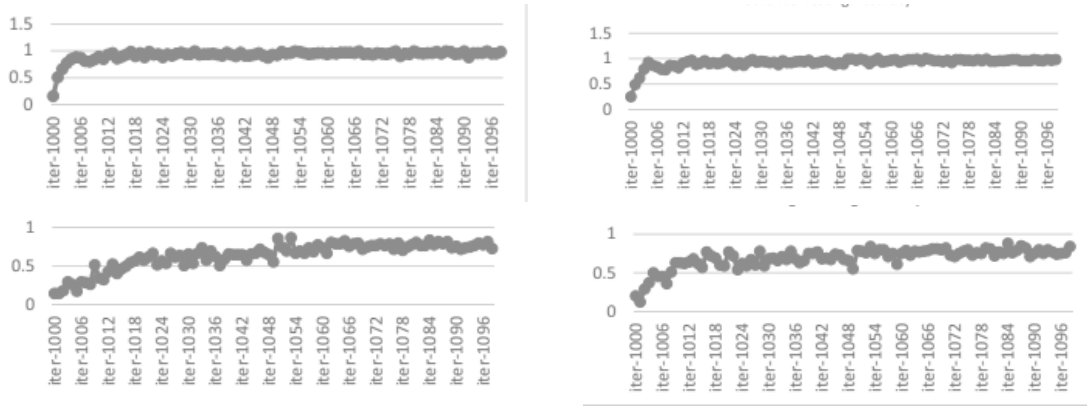

Figure 5: TensorFlow object detection and comparison chart

Deep learning approach has increasing the popularity and figure 5 shows that the performance factor results. It provides effective solution for analysing big data values. This paper provides classification of data and MNIST dataset for deep learning process. Sigmoid, Softsign and various existing models are compared. The workflow and deep convolution network are generated by using TensorFlow.

V. CONCLUSION

This paper provides object detection and data classification with deep learning model using TensorFlow. This method eliminates computation cost and performance is compared with existing methods. In this case, the output has suggestions, recommendation and remainder values. All the input actions are taken into account for processing and analysing the activation function. The classification accuracy obtained and increases the iteration process for calculating execution time. The deep convolution neural network model is good and efficient method for making effective decision. In future this method can be used for measuring different real time datasets.

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