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ATM- Robbery prevention using machine learning technique

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ABSTRACT

The idea if designing and implementation of the real-time ATM robbery prevention project came with the observation of real-time ATM robbery incidents around us. This project gives the alert at the instant of time when the thief is about to break the ATM machine.so, to overcome the drawbacks in the existing systems in our society. Whenever the thief is bringing the tools for the robbery into the ATM or when the thief is trying to use the tool to break, the CCTV camera on the ATM sense whether the person is bringing tools using the deep learning techniques and machine learning. Here the OpenCV and TensorFlow are used as the platform and the python language is used for the deep learning technics and Keras API were used for object detection. And an alert message is sent to both bank and police station nearby through the e-mail.

Keywords— *ATM, Deep learning, Open CV, Tensor flow, Python, G-mail, Keras API CCTV, Alert message*

1. INTRODUCTION

In today's technologically advanced world, the autonomous systems were in rapid development and popularity. As the computerization and the automation had become developed in the financial sectors.

The ATM and the debit & credit cards are introduced, installed and spread to the vast percentages of our society. Also, the crime and robbery related to the finance sector have increased and the robbery related to ATM is also increased vast in recent years. Among the robbery in the financial sectors had been increasing proportion of about 90 percentage. In the 2017-2018 the money lost on robbery, theft, dacoity, and burglary of ATMS is Rs.18.63cr. The ATM is found only after the robbery is done or when the ATM machine got attacked. Therefore, this project deals about the method to prevent the ATM robbery at the real time when the person is confirmed to possess any of the tools for the ATM robbery. So, by using deep learning and the machine learning techniques to detect the person possessing a valuable tool for theft. The Keras API is used to detect objects on the OpenCV and Tensor flow platform.

In this project, the alert message is sent to the bank and the other required users through the g-mail to their e-mail id.

2. LITERATURE REVIEW

Ertam, Fatih, and Galip Aydın. "Data classification with deep learning using Tensor flow." 2017 International Conference on Computer Science and Engineering. IEEE, 2017. This paper highlights the classification of big data sets to provide fast and efficient result by using the TensorFlow which was created by Google, we have studied and the functions used are Rectified Linear Unit, Hyperbolic Tangent, Exponential Linear Unit, sigmoid, soft plush and softsign. The Convolutional Neural Network and SoftMax classifier were also used as the deep learning artificial neural network.

Phadnis, Rasika, Jaya Mishra, and Shruti Bendale. "Objects Talk-Object Detection and Pattern Tracking Using Tensor Flow." 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT). IEEE, 2018. This paper highlights TensorFlow object detection API for the recognition of a pattern in the real-time video stream and detects the object that the user forget or will show the message if an anomaly is found.

Demirović, Damir, Emir Skejić, and Amira Šerifović–Trbalić. "Performance of Some Image Processing Algorithms in the Tensor flow." 2018 25th International Conference on Systems, Signals and Image Processing (IWSSIP). IEEE, 2018. This paper highlights the signal, image and synthetic aperture radar imagery in the processing of the huge data and overcoming the huge data's complexity and their processing is almost impossible in the real-time. TensorFlow GPU can outperform the multicore CPU for all algorithms, speedup range from 3.6 to 15.

3. PROPOSED SYSTEM

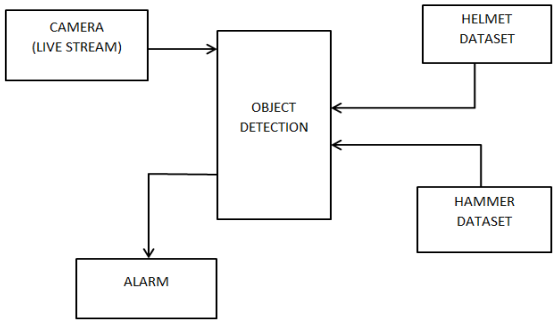

Fig. 1: Block diagram

Here we present the theory of the ATM-robbery prevention using machine learning technique the overall block diagram of the proposed system is explained. Each block of the block diagram is explained.

4. OBJECT DETECTION

4.1. Image processing

The image processing is the process of detection of the real-world object like a bottle, helmet, car etc. The image processing is also used in the detection of the faces, eyes, mouth etc. The image processing is done from the images, video and also in the live stream data. this image processing application is commonly used in the security, survey etc.

4.2 TensorFlow

Tensor flow is Google's Open Source Machine Learning Framework for dataflow programming across a range of tasks. Nodes in the graph represent mathematical operations, while the graph edges represent the multi-dimensional data arrays (tensors) communicated between them. Tensors are just multidimensional arrays, an extension of 2-dimensional tables to data with an advanced dimension. There are many features of Tensor flow which brands it suitable for Deep Learning. So, in this project, we implement Object Detection using Tensor flow.

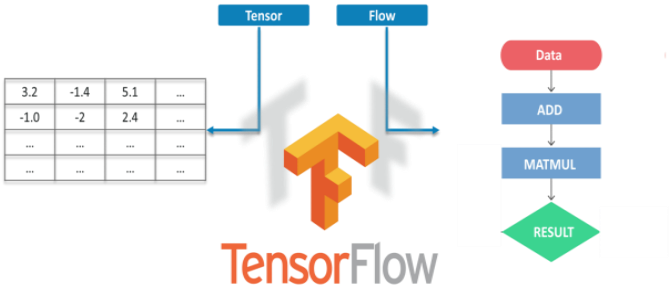

Fig. 2: TensorFlow

4.3 Object detection workflow

Every single Object Detection Algorithm has a different way of operational, but they all work on the same outlook. Feature Abstraction, They extract features from the input images at indicators and use these features to regulate the class of the image. Be it through Mat Lab, Open CV, Viola Jones or Deep Learning.

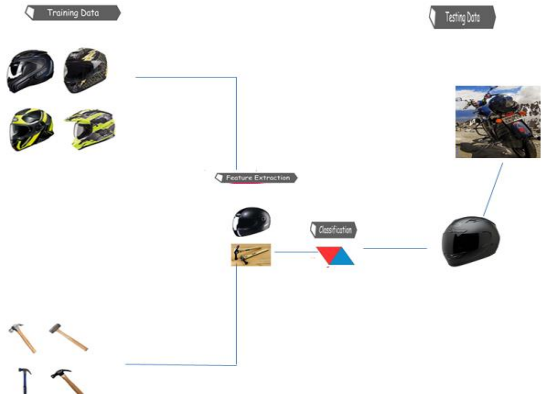

Fig. 3: Training process diagram of our product

4.4 Keras API

Keras API in the Tensor flow platform. Keras API is the high-level train and building deep learning models. Keras is an API designed for human beings, not machines. It puts the user experience front and centre. Keras follows best practices for reducing cognitive load, it minimizes the number of user actions required for common use cases, and it provides clear and actionable feedback upon user error.

4.5 Data processing

The images are required for the training for the detection of the object. The images should be of the same size and the same sized images are given as an input image to the training algorithm. The training algorithm gets the images.as all the deep learning techniques do, it separates the images into more number of pieces and processes each piece of images. After the processing of each piece of the image the processed piece of image is converted into the variable and stored as the .model file. The variable that is stored was given the different values for each variable to differentiate each other. The variable values are stored in form of a file in the .pickle format. The variable values hold the features of the trained images.

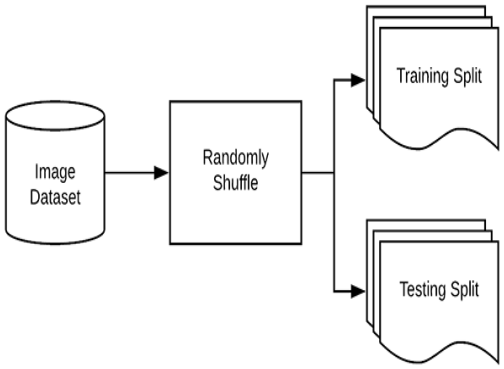

Fig. 4: Training data split

5. TRANING

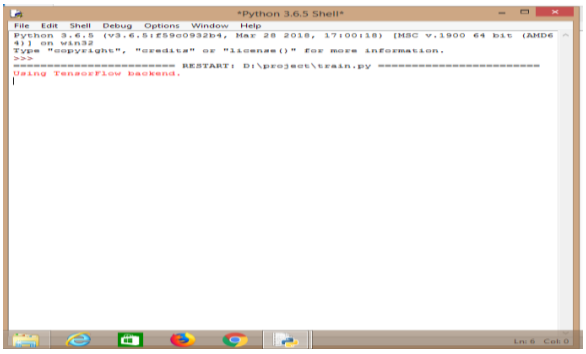

Fig. 5: the Beginning stage of training

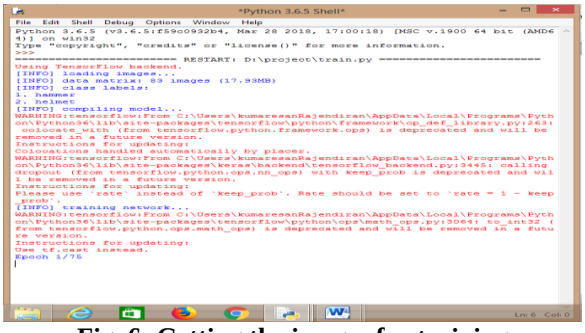

Fig. 6: Getting the images for training

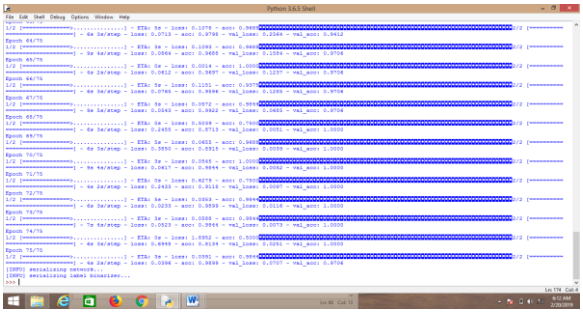

Fig. 7: Training completed

6. RESULT AND DISCUSSION

We implemented the model by using suitable Tensor flow by the Keras API on the Tensor flow with the importing of the packages keras.preprocessing.image for both ImageDataGenerater and img_to_array, keras. optimizers, sklearn.preprocessing, sklearn.model_selection, pyimagesearch.smallervggnet, matlabplot, imutils, numpy, argparse, random, pickle, OpenCV. These packages are used for grabbing the images from the sample and convert the images into the various segmented variables.

Each variable is given the values for the purpose to differentiate the variables form each other. The variables hold the features of the sample images that fetched to the training process.

The values of the testing images or the video are cut down into the frames and each frame is cut down into various parts and given values. The values are compared with the trained images value and detect and give accuracy and send mail while it matches the trained images.

7. OUTPUT

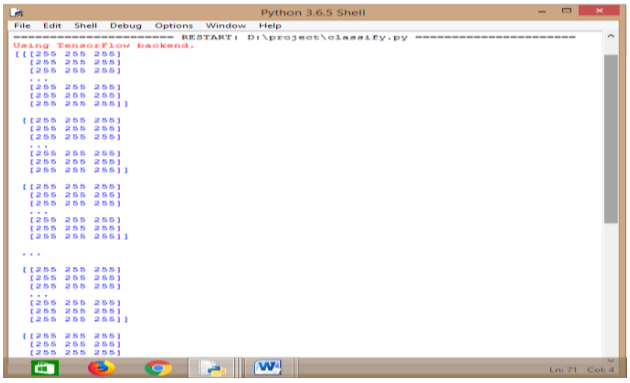

Fig. 8: Run the testing images

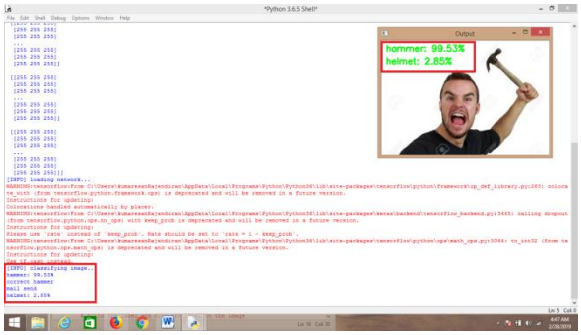

Fig. 9: Output

8. CONCLUSION AND FUTURE SCOPE

Implementing the object detection in the ATM security by detecting harmful objects by using the Tensor flow with the Keras API is the best model that will take only smaller time for the training the images for the detection. It has the best advantage of giving the perfect Accuracy percentage than the training cascade with the Cascade trainer GUI. This model can be used for training more number of objects of the user need. This model can be implemented in various real-time factors for various purposes.

9. FUTURE SCOPE

In future, more images can be trained.

- Can be implemented many government purposes
- Can be used for the survey prediction of people
- Can be added some more modules for more security purposes.

10. REFERENCES

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