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Detection of Bank Robbery Using Deep Learning Approach

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ABSTRACT: Tracking is a crucial part in varied traffic observance systems and detection of varied internet applications, security infrastructures, safety observance, and recognition of objects for mobile devices etc. One major application space of this method is that the detection of theft. Deep learning is that the section of AI that is attached imitating the educational approach that men utilize to induce some differing types of data. There square measure some ideas that is additionally utilized in Deep learning as a basic issues of laptop vision and multi-media content analysis in video analysing. the \$64000 time weapon detection system with the power to mechanically acknowledge the video pictures and also the pictures are going to be capture and send to station house with the assistance of SMTP protocol. the power is to mechanically analyse the video pictures and also the pictures with weapon and knife object is detected alerts square measure mechanically. A digital closed-circuit television wherever the CCTV camera and target for small-scale user is developed. the most recent technologies square measure to seek out the thefts activities and destruction employed by video closed-circuit television. By victimization this, it's potential to capture and monitor by the user at every and each moment and every and each second of the world coverage. The up-to date technologies used square measure easy for the surroundings, as an example the observance systems that is to spot the human behaviour in police work the crime to not actively participate in stopping the crime. Therefore, the projected methodology is to sight the motion in an exceedingly live video stream surroundings and it generate alert by causing alert message to nearest station house (or) international intelligence agency.

I. INTRODUCTION

Abnormal situation prediction from a camera is very important while working on a field of computer vision. In the modern era of science and technology, people setup surveillance cameras in different areas to get rid of robbery in bank. Still, it cannot help people as quick as people want to respond. Usually, after occurrence of a robbery scene, law enforcement agencies come to the area and take the footage from the video that was recorded at the time of the robbery bank. Then, law enforcement agencies analyze the video and take necessary evidence of a robbery scene. We believe this is a very slow process to act on a robbery scene. For this reason, we wanted to make a system that can quickly act on a robbery scene. Moreover, there are a lot of cameras being installed in different areas by law enforcement agencies or by any organization. They have to monitor all the cameras at a time with a human being.

II. LITERATURE REVIEW

[1] C. J. I. S. Division, "Crime within the bank theft," 2019. within the past twenty years armed and partly coated face-related robberies, become a large downside for society. In the USA, these robberies accounted for AN calculable 438 million in losses and annually there have been quite a thousand murders according.

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[2] I. F. S. R. Giorgio Morales, "detecting Violent Robberies in CCTV Videos victimization Deep Learning," computer science Applications and Innovations, pp. 282-291, 2019.,In case of that to avoid or minimize this social downside there have been many researchers have done.

[3] O. D. M. M. Milagro Fernandez-Carrobles, "Gun and Knife Detection supported quicker R-CNN for Video police investigation," Iberian Conference on Pattern Recognition and Image Analysis, pp. 441-452, 22 9 2019. However, the planned system is for sleuthing armed and partly coated face connected robberies identification.

III. EXISTING SYSTEM

A CCTV based tracking of thieves with the theft detection methods.The CCTV footage by image processing technique without sensors used to detect theft and motion of thieves.There is no proper communication in existing method.This also helps the user in providing a legal proof of some inappropriate activity since a video coverage can be used as a proof in the court of law.

IV. PROPOSED SYSTEM

The proposed system is fully autonomous detection of bank robberies. To achieve this goal there are two main data science components in the prototype. They are gun weapon and Knife Identification component, partially covered face detection component used in this system. The proposed solution used an object detection model and a facial landmark identification-based approach to detect robbers. Because of this existing system, has no longer the security officers need to monitor CCTV cameras by themselves.

V. BLOCK DIAGRAM

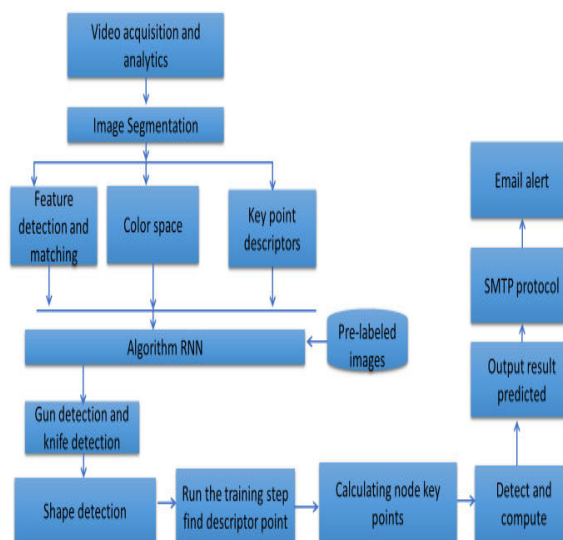


Figure 1 : block diagram of the proposed system

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VI. METHODOLOGY

* In this Recurrent neural network (RNN) is a type of neural network where the output from previous step is fed as input to the current step. In traditional neural networks, all the inputs and outputs are independent of each other, but in cases like when it is required to predict the next word of a sentence, the previous words are required and hence there is a need to remember the previous words

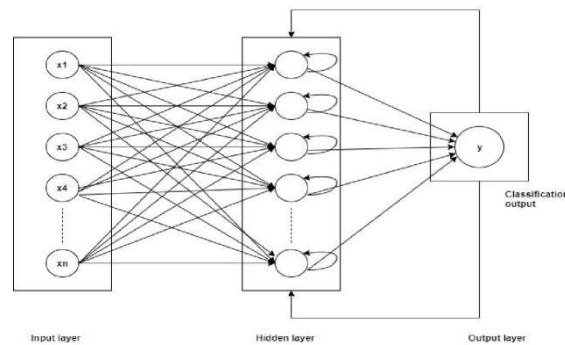
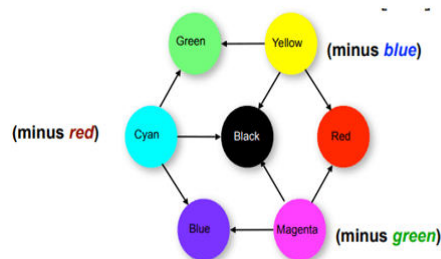


Figure 2: Recurrent Neural Network

. Color spaces are the mathematical representation of a set of colors. There are many color models. Some of them are RGB, CMYK, YIQ, HSV, and HLS, etc. These color spaces are directly related to saturation and brightness. All of these color spaces can be derived using RGB information using devices such as cameras and scanners.

- ✓ RGB stands for Red, Green, and Blue. This color space is widely used in computer graphics. RGB are the main colors from which many colors can be made.
- ✓ RGB can be represented in the 3-dimensional form:

CMYK stands for Cyan, Magenta, Yellow and Black. CMYK color model is used in electrostatic and ink-jet plotters which deposits the pigmentation on paper. In these model, specified color is subtracted from the white light rather than adding blackness. It follows the Cartesian coordinate system and its subset is a unit cube. blackness. It follows the Cartesian coordinate system and its subset is a unit cube.



VII. SYSTEM SOFTWARE

Atom is a free and open-source text and source code editor for macOS, Linux, and Microsoft Windows with support for plug-ins written in JavaScript, and embedded Git Control. Developed by GitHub, Atom is a desktop application built using web technologies. Most of the extending packages have free software licenses and are community-built and maintained. Atom is based on Electron (formerly known as Atom Shell), a framework that enables cross-platform desktop applications using Chromium and Node.js. Atom is written in Coffee Script and Less, but much of it has been converted to JavaScript.

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To get started with Atom and get in on your system, head over to their official website. At the top of the page you should see a download button as shown here:

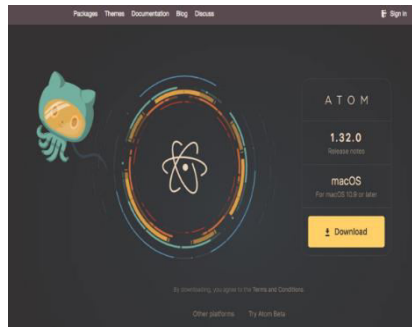


Fig no 7: Atom download page

PyQt5 is that the latest version of a graphical user interface widgets toolkit developed by riverside Computing. it's a Python interface for Qt, one among the foremost powerful, and well-liked cross-platform graphical user interface library. PyQt5 may be a mix of Python programming language and also the Qt library. This introductory tutorial can assist you in making graphical applications with the assistance of PyQt. Our tutorial on earlier version – PyQt4 is on the market here.

PyQt may be a graphical user interface widgets toolkit. it's a Python interface for Qt, one among the foremost powerful, and well-liked cross-platform graphical user interface library. PyQt was developed by riverside Computing Ltd. the most recent version of PyQt will be downloaded from its official web site [web site riverbankcomputing.com](http://web.site/riverbankcomputing.com)

Python

In technical terms, Python is an object-oriented, high-level programming language with integrated dynamic semantics primarily for web and app development. It is extremely attractive in the field of Rapid Application Development because it offers dynamic typing and dynamic binding options.

Python is relatively simple, so it's easy to learn since it requires a unique syntax that focuses on readability. Developers can read and translate Python code much easier than other languages. In turn, this reduces the cost .

VIII. CONCLUSION

We can successfully detect abnormal situation with case numbers on which we can predict the anomaly occurred or not. The wrong data is reduced that makes us our model very efficient for this task compared to other models. To implement a system that employs RNN (Recurrent Neural Network) algorithm to serve the purpose of the system. The results are given in percentage for each of the objects we want to detect such has gun and knife in bank robbery. Predicting abnormal situation by detecting threatening objects can have far reaching impact on computer vision field. For our datasets, the test accuracy is 99.2 % that is very competitive with the systems we have seen so far

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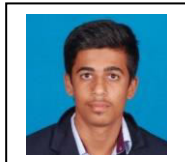
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