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Suspicious Activity Detection

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Abstract: ***Unpredictable activities is guessing a person's physical location or joint activity based on images or videos. The project will require the use of neural networks to detect human activities from CCTV images. Human behavior is one of the fundamental problems in computer vision and has been studied for over 15 years. This is important because the number of applications that can benefit from the search function is huge. For example, it is used in applications such as human prediction, video analysis, animal analysis and behavior understanding, language recognition, human relations-computer, and characters are less powerful. While low-cost depth sensors have limitations such as being limited to indoor use, their low-noise data and low depth make it difficult to estimate humans from depth images. Therefore, we plan to use neural networks to solve these problems. Analyzing human activity through image analysis is an active area of research in image processing and computer vision. Thanks to visual monitoring, human activities in public places such as bus stops, train stations, airports, banks, shopping malls, schools, parking lots and roads can be monitored in order to prevent attacks, theft, accidents, illegal parking, violence, fights and chain events. purse snatching etc. illegal and other activities. It is very difficult to monitor public places regularly, so there is a need for intelligent video surveillance that can monitor people's activities in real time and divide them into tasks, normal and abnormal activities; and can generate an alarm. Often research is done with images rather than video. Also, none of the published articles attempt to use CNNs to detect suspicious activity.***

I. INTRODUCTION

We plan to create an application to detect suspicious activities of people in public places. Our system can be used for surveillance purposes in shopping malls, airports, train stations and other places where there is a risk of theft or shooting. We will use deep learning and neural networks to train our system. This mockup will ship as a mobile and desktop app that uses CCTV footage in feedback and sends an alert message to the manager's device when something suspicious is detected. Human trafficking is associated with identifying people's bodies and possibly tracking their movements. Its real-life applications range from gaming to AR/VR to healthcare to gesture recognition. Compared to the image data domain, there are some studies using CNN for video classification. This is because video is more difficult than photos because it has another dimension: time. The unsupervised learning method uses the time between frames and has proven successful in video analysis.

Combining computer vision with video surveillance ensures public safety. This involves modeling environments, detecting motion, classifying objects, tracking, understanding behavior, and combining information from multiple cameras. It requires pre-processing to extract features from video sequences.

The proposed system will use footages obtained from CCTV camera for monitoring the human behavior in a campus and gently warn when any suspicious event occurs. The major components in intelligent video monitoring are event detection and human behavior recognition. Automatic understanding of human behavior is a challenging task. In a campus, different areas are under video surveillance and various activities are to be monitored. The video footage obtained from campus has been used for testing. The entire process of training a surveillance system can be summarized in to three phases: data preparation, training the model and inference. The framework consists of two neural networks CNN and Recurrent Neural Network (RNN). CNN is used for the purpose of extracting high level features from the images so that the complexity of the input can be reduced. RNN is used for the classification purpose, which is well suited for processing of video stream.

The proposed system is using a pre-trained model called VGG-16(Visual Geometry Group), which is trained on the ImageNet dataset. Currently, model is training in such a way to predict behavior from the footage. The model is able to predict suspicious or normal human behavior in the footage which is used to aid the monitoring process. Most of the current system uses the footages obtained from CCTV cameras. If any crime or violence happens, this video will be used for investigation purpose. But if we consider a system which will automatically detects any unusual or abnormal situation in advance and a mechanism to alert the respective authority is more interesting and which can be applied to indoor and outdoor places. The proposed method is to design such a system in an academic area.

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II. LITERATURE SURVEY

1) Intelligent Analyzer for Unattended Object Detection by Rutuja Y Khadse Problem Found the common research used is posed expression datasets that are not based on authentic emotions.
2) Abandoned Object Detection and Tracking Using CCTV Camera by Parakh Agarwal Sanaj Singh Problem Identify Vulnerable detection, Potential privacy issues.
3) An intelligent video analytics model for abnormal event detection in online surveillance video by krishnan Balasundaram C. Chellappan Work On Because of the subjective nature of emotions, emotional AI is especially prone to bias
4) Deep Learning Approach for Suspicious Activity Detection from Surveillance Video by Amrutha cv, Jyotsna Problem in It is not working on live CCTV footage. Algorithm efficiency not more correct, less speed of execution.

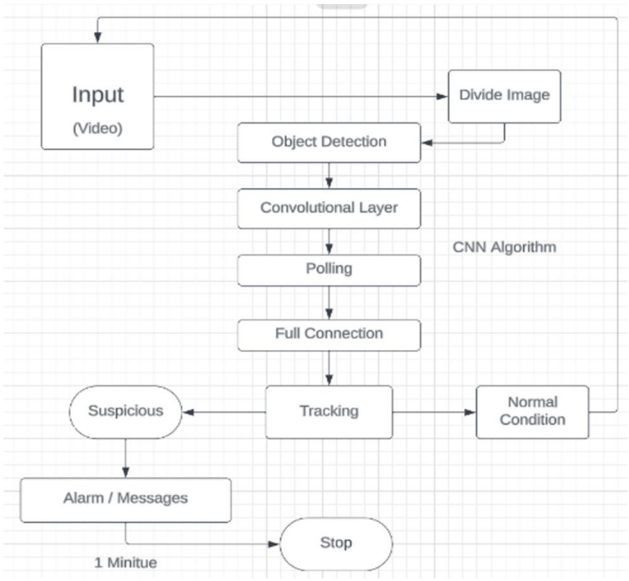
III. SYSTEM OVERVIEW

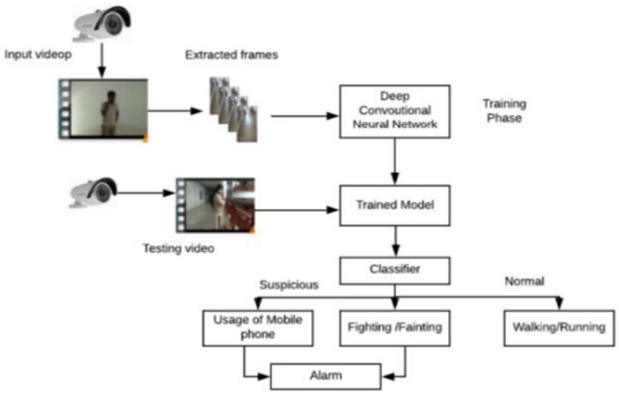
The proposed system will use footages obtained from CCTV camera for monitoring students' activities in a campus and send message to the corresponding authority when any suspicious event occurs.

A. System Architecture

The architecture has different phases like video capture, video pre-processing, feature extraction, classification and prediction. The general layout of the system architecture is shown in Figs. The system classifies the videos into three classes.

1) Students using Mobile phone inside the campus- Suspicious class
2) Students fighting or fainting in campus-Suspicious class
3) Walking, running- Normal class





B. Capture

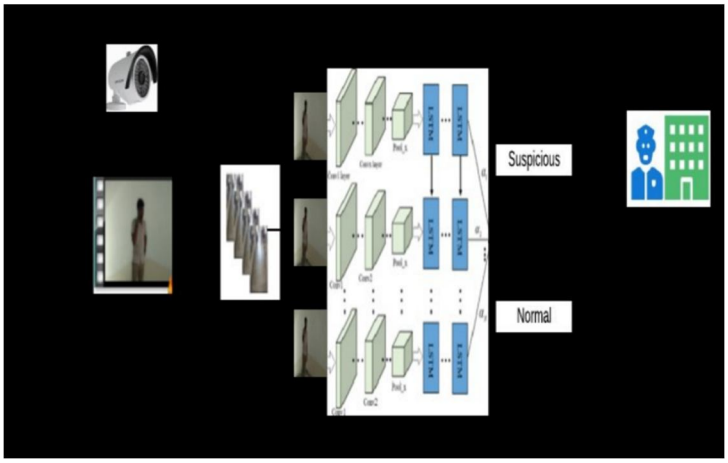
Installation of CCTV camera and monitoring the footage is the initial step in video surveillance system. Various kinds of videos are captured from different cameras, covering the whole area of surveillance. The processing in our implementation is carried out using frames, so the videos are converted to frames.

C. Process

Divided image converts into frame all frame scan and analyze using CNN Algorithm frame detection and extracts the all object of frame it using CNN Algorithm identify activity suspension or not it image scan face expression as well as scan Weapon related Object. We do first train to model using testing video that help to suspension activate detection similar types event happened it take action send to message to user. It This Fig Compare the Training model And Current video Comparison and identify activity it considers check single frame and moment of object scanning. Analyzing the Video.

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Image Convert into Matrix Point Mathematical Operation using more accurate result is found.



IV. SYSTEM REEQUIPMENT

A. Software Requirements

1) Navigator
a) Anaconda
b) Spyder
c) Jupyter Notebook

2) Message Pass Application
3) Windows Operating system 7/8/10/11
4) Python

B. Hardware Requirements

1) I5 Processes
2) 250 GB Hard Disk
3) 4 GB RAM

V. APPLICATIONS

1) Recognition Object
2) Decoding Facial Recognition
3) Collecting Historic and Environmental Elements
4) Detection Pattern
5) Classrooms
6) Hospital
7) Industries
8) Banking

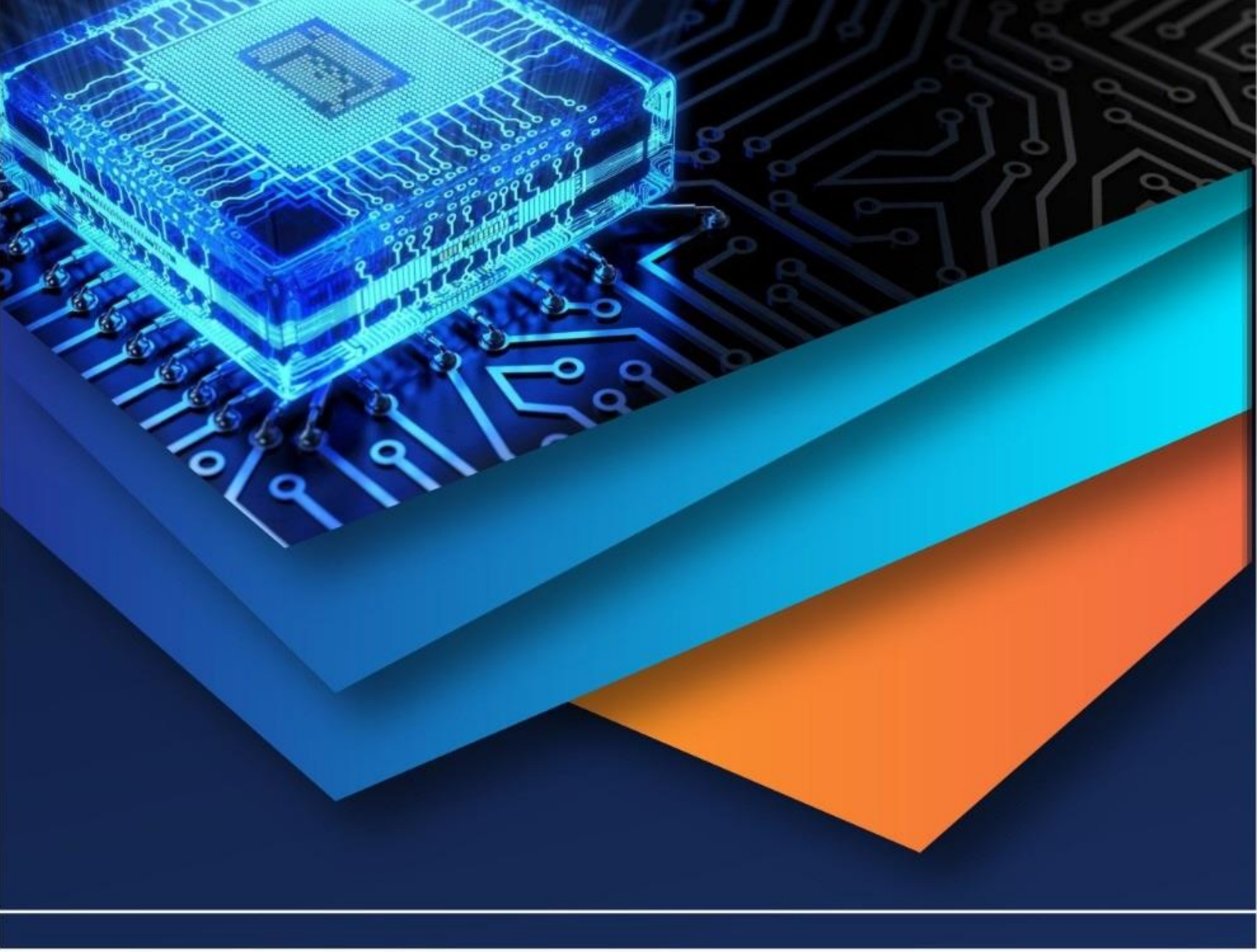
VI. CONCLUSION AND FUTURE WORK

In present world, almost all the people are aware of the importance of CCTV footages, but most of the cases these footages are being used for the investigation purposes after a crime/incident have been happened. The proposed model has the benefit of stopping the crime before it happens. The real time CCTV footages are being tracked and analyzed. The result of the analysis is a command to the respective authority to take an action if in case the result indicates an untoward incident is going to happen. Hence this can be stopped. Even though the proposed system is limited to academic area, this can also be used to predict more suspicious behaviors at public or private places. The model can be used in any scenario where the training should be given with the suspicious activity suiting for that scenario. The model can be improved by identifying the suspicious individual from the suspicious activity.

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