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SUSPICIOUS ACTIVITY TRACKING AI CAMERA

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Abstract- The latest progress in the technology has led to automation and digitization in almost every field, and has influenced a wide scope of application. This has caused enormous amount of data flow from each sector, where the information contained in the data acts as the important component for the progress of the single person, organization, state, country and so on. These data with valuable information can be used in the constructive and the destructive perceptive based on the hands that handle it. So protective measures become very essential for preserving the data from unwanted access. This paves for developing a system to identify the suspicious movement in the public areas like military regimes, schools, colleges, hospitals and financial organizations to safe the data. The method put forward in the paper incorporates the motion sensors and the face identification system to detect the suspicious activities and report to the lawful person. The algorithm for the system was developed using the python and tested for various sets of exemplary real time video recordings to know the accuracy in the detection.

Keywords: Smart Security, Suspicious Activity, Motion Sensors, Facial Identification

1.INTRODUCTION

Tracking and detecting suspicious activity is one of the most demanding tasks for many security personnel and systems. If a security system fails in places like airports and banks, then criminals will get an advantage to carry out theft at gunpoint. Out of fear, people won't be able to call the police for help. But if a smart camera can detect any suspicious activity and automatically trigger an alarm to call the police, then such criminal acts can be prevented. Suspicious Human Activity Recognition from Video Surveillance is an active research area of image processing and computer vision which involves recognition of human activity and categorizes them into normal and abnormal activities. Abnormal activities are the unusual or suspicious activities rarely performed by the human at public places, such as left luggage for explosive attacks, theft, running crowd, fights and attacks, vandalism and crossing borders. Normal activities are the usual activities performed by the human at public places, such as running, boxing, jogging and walking, hand waving and clapping. Now-a-days, use of video surveillance is increasing day by day to monitor the human activity which prevents the suspicious activities of the human. An important chore of the video surveillance is to analyze the captured video frames for identifying unusual or suspicious activities in security-sensitive region of any country such as banks, parking lots, department stores, government buildings, prisons, military bases (Gouaillier and Fleurant 2009). Video Surveillance captures images of moving objects in order to watch assault and fraud, comings and goings, prevent theft, as well as manage crowd movements and incidents (Gouaillier and Fleurant 2009). In public places, human performs normal (usual) and abnormal (suspicious or unusual) activities [11]. Normal activities are the usual activities that are not dangerous for the human world but abnormal activities may be dangerous for all over the world. Therefore, an intelligent surveillance system is required that can recognize all the activities and identify the more dangerous and suspicious activities performed by a human being. There are two types of surveillance system-first is semi-autonomous in which video is recorded and sent for analysis by human expert. Non-intelligent video surveillance requires the

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continuous monitoring by human, which is very costly, problematic and also very difficult and challenging to watch over all the videos continuously by a guard to prevent the suspicious 2 human activity. Therefore, a second Fully-autonomous surveillance system is required that performs low level tasks-motion detection, tracking, classification and identification of abnormal event [12].

2.OBJECTIVE

The main motor of this projects is to increase intelligence in video surveillance.Toincrease the intelligence of the video surveillance system, detect all the irregular movements within the area and select the suspicious ones.Theft reduction, asset protection, security investigations, providing evidence

3.LITERATURE SURVEY

In the ability of humans to vigilantly monitor video surveillance live footage led to the demand for artificial intelligence that could better serve the task. Humans watching a single video monitor for more than twenty minutes lose 95% of their ability to maintain attention sufficient to discern significant events [13]. With two monitors this is cut in half again. Given that many facilities have dozens or even hundreds of cameras, the task is clearly beyond human ability. In general, the camera views of empty hallways, storage facilities, parking lots or structures are exceedingly boring and thus attention is quickly attenuated

4. DESCRIPTION OF THE PROJECT

4.1PROPOSED SYSTEM

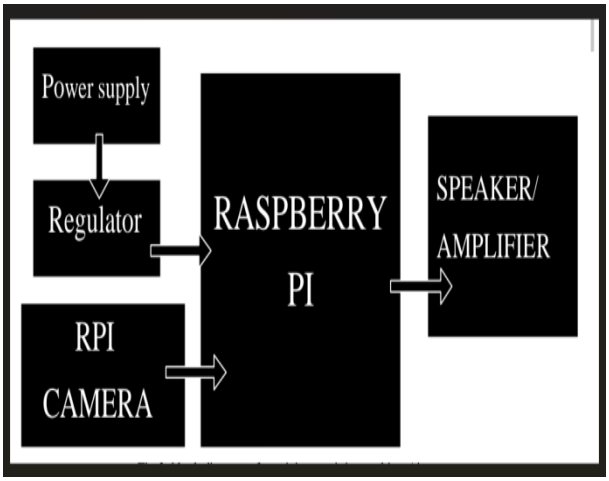

Fig.1.: System Architecture

4.2 FLOW CHART

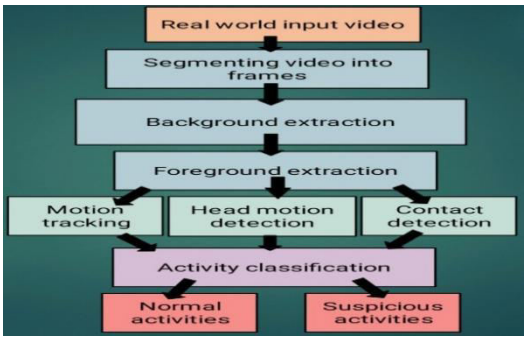

Fig.2.: the flowchart of suspicious activity tracking Ai camera

4.3HARDWARE RECQUIREMENTS

RASPBERRY Pi 4

Raspberry Pi 4 Model B was released in June 2019 with a 1.5 GHz 64-bit quad core ARM Cortex-A72 processor, on-board 802.11ac Wi-Fi, Bluetooth 5, full gigabit Ethernet (throughput not limited), two USB 2.0 ports, two USB 3.0 ports, 2-8 GB of RAM, and dual-monitor support via a pair of micro HDMI (HDMI Type D) ports for up to 4K resolution. The version with 1 GB RAM has been abandoned and the prices of the 2 GB version have been reduced. The 8 GB version has a revised circuit board. The Pi 4 is also powered via a USB-C port, enabling additional power to be provided to downstream peripherals, when used with an appropriate PSU. But the Pi can only be operated with 5 volts and not 9 or 12 volts like other mini computers of this class. The initial Raspberry Pi 4 board has a design flaw where third-party e-marked USB cables, such as those used on Apple MacBooks, incorrectly identify it and refuse to provide power. Tom's Hardware tested 14 different cables and found that 11 of them turned on and powered the Pi without issue. The design flaw was fixed in revision 1.2 of the board, released in late 2019. In mid-2021, Pi 4 B models appeared with the improved Broadcom BCM2711C0. The manufacturer is now using this chip for the Pi 4 B and Pi 400. However, the tack frequency of the Pi 4 B was not increased in the factory

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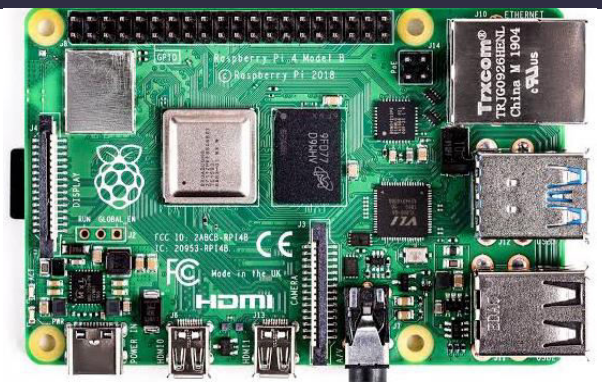

Fig.3.: Raspberry Pi 4

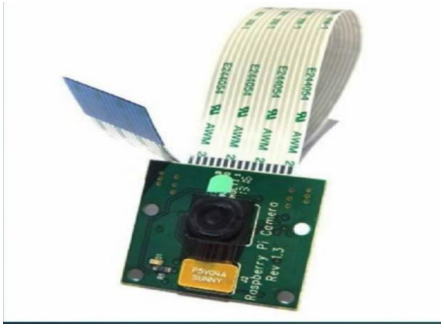

Fig.4.: RPI Camera module

The sensor itself has a native resolution of 5 megapixels and has a fixed focus lens on board. In terms of still images, the camera is capable of 2592 x 1944-pixel static images, and also supports 1080p30, 720p60 and 640x480p60/90 video. No adapters required! This camera will plug directly into the Raspberry Pi 3 Model B camera port! These 5 megapixels sensor with OV5647 camera module is capable of 1080p video and still images that connect directly to your Raspberry Pi. This is the plug-and-play compatible latest version of the Raspbian operating system[1], making it perfect for time lapse photography, recording video, motion detection and security applications. Connect the included ribbon cable to the CSI (Camera Serial Interface) port on your Raspberry Pi, and you are good to go! The board itself is tiny, at around 25mm x 23mm x 9mm and weighing in at just over 3g, making it perfect for mobile or other applications where size and weight are important. The sensor has a native resolution of 5 megapixel, and has a fixed focus lens on board. In terms of still images, the camera is capable of 2592 x 1944-pixel static images, and also supports 1080p30, 720p60 and 640x480p90 video.

Note: This module is only capable of taking pictures and video, not sound.

VOLTAGE REGULATOR

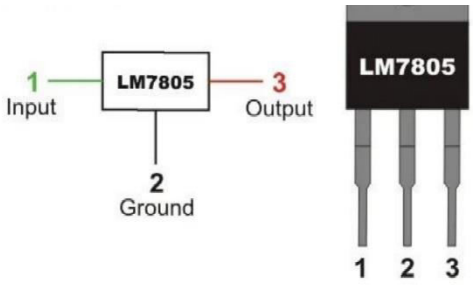

Fig.5.: voltage regulator

SPEAKER

Fig.6.: Speaker

Raspberry Pi does not have a speaker. However, there are several audio output modes that you can connect a speaker to. You can connect Raspberry Pi to a speaker physically with an audio jack or a USB port

SD CARD

Fig.7.: micro SD card and micro SD card to SD card adaptor

4.4 SOFTWARE REQUIREMEMENTS

- AIML code

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- JAVA Script

4.5 IMPLEMENTATION OF PROJECT

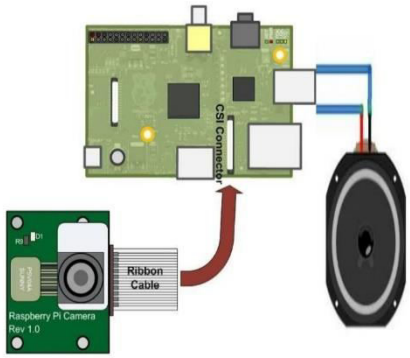

Fig.8.: Schematic Diagram

Tracking and detecting suspicious activity is one of the most demanding tasks for many security personnel and systems. If a security system fails in places like airports and banks, then criminals will get an advantage to carry out theft at gunpoint. Out of fear, people won't be able to call the police for help [2]. But if a smart camera can detect any suspicious activity and automatically trigger an alarm to call the police, then such criminal acts can be prevented Click on the start button and perform the suspicious activity in front of the camera[3]. The python model will try to recognize it and if found unusual, will issue an alert through speakers

4.6. TESTING

Fig.9.: some activities

Save the JavaScript code as .html and open it in any browser with JavaScript enabled. Click on the start button and perform the suspicious activity[4] in front of the camera. The ML model will try to recognize it and if found unusual, will issue an alert. We are also add functions for automatically calling[5] and messaging the police

5.RESULT

Fig.10.: Result

When we perform the suspicious activity in front of the camera the camera will try to recognize it and if found unusual, will issue an alert using speaker that nuisance detected.

6. CONCLUSION AND FUTUIRE WORK

In this project, we have done the various techniques related to abandoned object detection, theft detection, falling detection, accidents and illegal parking detection, violence detection and fire detection for the foreground object extraction, tracking, feature extraction and classification. In past decades, several researchers proposed novel approaches with noise removal, illumination handling, and occlusion handling methods to reduce the false object detection. Many researchers have also worked for making real-time intelligent surveillance system but processing rate of the video frames is not as good as required and there is no such system that has been developed with 100% detection accuracy and 0% false detection rate for videos having complex background. Much of the attention is required in the following suspicious activities detection: Abandoned object detection and theft detection Majority of the works have been done for the abandoned object detection from surveillance videos captured by static cameras. Suspicious human activity recognition: a review works detected the static human as an abandoned object [6]. To resolve such problems, human detection method should be very

effective and system should check the presence of the owner in the scene, if owner is invisible in the scene for long duration, then alarm should be raised. To resolve the problem of theft or object removal [7], face of the person who is picking up the static object, should match with the owner otherwise an alarm must be raised to alert the security. Future work may also resolve the low contrast situation i.e., similar color problem such as black bag and black background which lead to miss detections [8]. Future improvements may be integration of intensity and depth cues in the form of 3D aggregation of evidence and occlusion analysis in detail. Spatial-temporal features can be extended to 3-dimensional space for the improvement of abandoned object detection method for various complex environments [9]. Thresholding based future works can improve the performance of the surveillance system by using adaptive or hysteresis thresholding approaches. Few works have been also proposed for abandoned object detection from the multiple views captured by multiple cameras. To incorporate these multiple views to infer the information about abandoned object can also be improved. There is a large scope to detect abandoned object from videos captured by moving cameras. 40 Falling detection Most of the works have been done for fall detection of single person in indoor videos based on human shape analysis, posture estimation analysis and motion-based analysis. Future works can include the integration of multiple elderly monitoring which is able to monitor more than one person in the indoor scene [10]. Many elder people go for morning walk every day in public areas such as parks; to monitor these elder people, a future work can include one or more than one human fall detection from outdoor surveillance videos. Accidents, illegal parking, and rule breaking traffic detection Several researchers have presented accidents detection, illegal parking detection and illegal U-turn detections from static video surveillance. These systems become incapable to detect these abnormal activities in more crowded traffic on roads. Future works should be based on unsupervised learning of transportation system because of no standard dataset is available for the training. Violence detection Several research works have been done for the prevention of violence activities such as vandalism, fighting, shooting, punching, and hitting. To detect such violence activities, single view static video camera has been used but sometimes this system fails in occlusion handling. Therefore, a multi-view system has been proposed by few researchers to resolve this problem but it requires important cooperation between all views at the low-level steps for abnormal activity detection. Future work may be automatic surveillance system for moving videos. Improvements are required in accuracy, false alarm reduction, and frame rate to develop an intelligent surveillance system for the road traffic monitoring. Fire detection Future work can include more improvement in accuracy, frame rate, false alarms reduction and also it can be improved to detect far distant small fire covered by dense smoke

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