SMART CCTV

-BY

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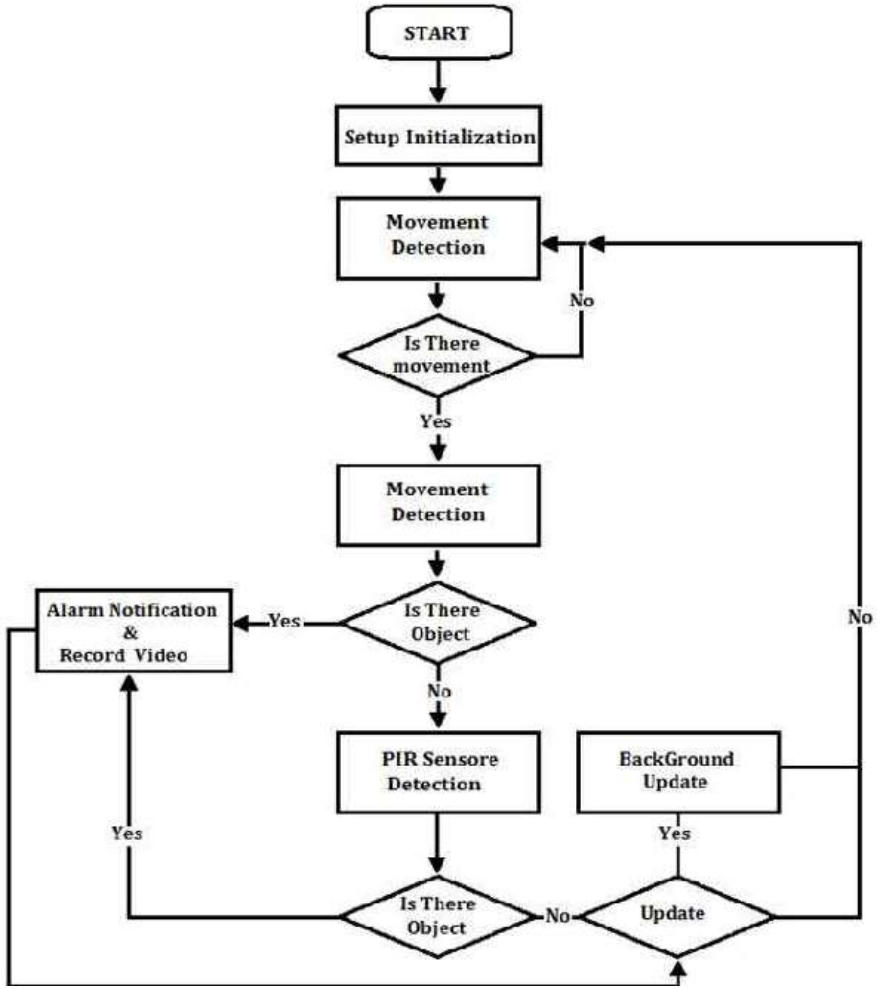
Introduction

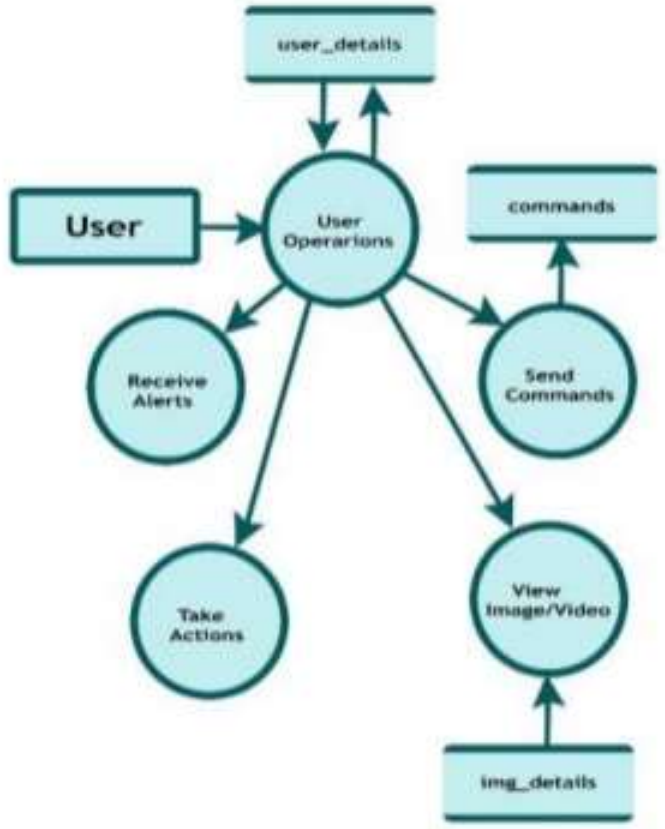
- The issue of mass surveillance in CCTV camera feed is very important. Surveillance can be of different forms like malicious activity detection, identification of a particular entity particular individual in a CCTV video or in general keeping tracks of movements of human beings.

- In our project, the focus has been given to find the path of human through the CCTV cameras also called tracking through object detection via image processing .

Flow Chart


START
Setup Initialization
Movement Detection
No
Is There movement
Yes
Movement Detection
Alarm Notification & Record Video
Yes
Is There Object
No
No
PIR Sensore Detection
BackGround Update
Yes
Yes
Is There Object
No
Update

DFD Diagram


user_details
User
User Operarions
commands
Receive Alerts
Send Commands
Take Actions
View Image/Video
img_details

About Project

- We have made this project in python , machine learning basically in this project we have used opencv library as we know that it is huge open source library for computer vision , machine learning and image processing.

- Basically our aim in this project is to make cctv which record all the activity of a person like in and out time , monitoring , record the footage and many more.

- Also we have used PIL (Python Imaging Library)which provides the python interpreter with image editing capabilities. Supports Image Archieve we can convert image from one format to another.

Opencv

- OpenCV is a huge open-source library for computer vision, machine learning, and image processing. OpenCV supports a wide variety of programming languages like Python, C++, Java, etc.

- It can process images and videos to identify objects, faces, or even the handwriting of a human. When it is integrated with various libraries, such as Numpy which is a highly optimized library for numerical operations, whatever operations one can do in Numpy can be combined with OpenCV.

- This OpenCV tutorial will help you learn the Image-processing from Basics to Advance, like operations on Images, Videos using a huge set of Opencv-programs and projects.

Tkinter Python

- **Tkinter** is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit. Import the Tkinter module.

  Creating a GUI application using Tkinter is an easy task. All you need to do is perform the following steps −
- Import the Tkinter module.
- Create the GUI application main window.
- Add one or more of the above-mentioned widgets to the GUI application.
- Enter the main event loop to take action against each event triggered by the user.
- It consist of 15 types of widgets some of there are Button, Canavas , Frame , Entry , Label , Menu , Message and many more.

Modules of our project

- **Monitor**

  A CCTV monitor is a display device that is usually connected to a feed from a surveillance video recording device.

- **In and Out**

  It generally records data of person which time he/she enters and at which time he exits in in folder and out folder.

- **Rectangle**

  In this it tells us to choose the directon or we can say we have to choose the portion , if there's motion in that portion then it will record / track it in the form of document .

- **Record**

  This function in our project is been used to record the footage we have to start recording and it would save the recording when we stop so we can say it is like video recorder .

Hardware and software requirements

Tools and Technology:-

- Image processing with Core Python

- **Hardware requirements :**

  1) x64 based processor

  2) 4GB RAM

- **Software requirements :**

  1)Python 3.6 and above

  2) Packages: Opencv tkinter , PIL

Functional Requirements(Scope)

- Image processing via object detecion.

- Detect -> Process -> store – it means that first it would detect the user then it will process the image after image processing is done after that it will store in form of image/video after tracking in camera .

Advantages and Disadvantages

Advantages :-

1) Monitors activities.
2) Collect evidence.
3) Decision Making.
4) Keep records.

Disadvantages :-

1) One of the biggest disadvantages of CCTV use deals with privacy, especially when used in the workplace.
2) Expensive , doesnot stop crime.

Learning Outcome :

- While making this project we have explored python libraries like opencv, PIL, Tkinter also we have learned concept of image processing , how to detect object in our application/project , how to store image in different formats with the use of PIL library .