SECUCAM: SECURITY CAMERA WITH MOVEMENT DETECTION

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ABSTRACT

The project is based on motion detection using Artificial Intelligence. Using AI, we will be detecting any kind of motion/activity. We will be looking for any kind of human interference in a restricted area/ place. Our current system will use the 'opencv' module to detect motion, face as well as any human activity. For security purposes the application also sends a one-time password verification for granting   the privileges to access the camera. The 'otp' will be sent on the email and registered phone number, only and only then the camera will be accessible to the respective user. When the camera will be active and if it detects any kind of activity, an alarm will go off. The footage will get recorded automatically and stored in the user's system with the time and date.

Keywords: Security Camera, Motion Detection Add-On, Surveillance, Open-CV.

I.   INTRODUCTION

Security cameras that are internet-ready are a good way of monitoring your home or your business. This allows owners to keep an eye on their property while they are away. There are even surveillance systems that can notify you through email when movement has been detected. So the project which we made is based on motion detection using Artificial Intelligence. Using AI, we will be detecting any kind of motion, activity. We will be looking for any kind of human interference in a restricted area/ place.

II.   LITERATURE REVIEW

After reviewing various research papers we realized that in some research papers there were some drawbacks which were covered in other papers. Rather than focusing on one paper we took the ideologies from the papers we reviewed, and took the relevant points of those papers to constitute in our project. The reason is very simple: OpenCV is used as an image processing library in many computer vision real-time applications. There are thousands of functions available in OpenCV. These simple techniques are used to shape our images in our required format. So we decided to implement our project using OpenCV library. We decided to implement OpenCV because while reviewing journal papers we noticed that in some papers they used programming language Java for creating their application which is quite difficult to understand and it's time consuming, there were some features which didn't provide the facility of OTP verification so anyone could access the system information. So we decided and concluded to add some features in our project for the user to make it more secure and easier to use.

III.   METHODOLOGY

We have provided the user with some basic requirements and features such as:

1. User will first have to enter their email on which they will receive a verification code and only if it correct, the user will be able to proceed.
2. Once the user has logged in the motion detection on the available cameras will start.
3. After it is turned on, if any motion/movement is detected then the alarm would go off along with an email to the user.
4. Also the recording will start and it would be saved on the local machine.
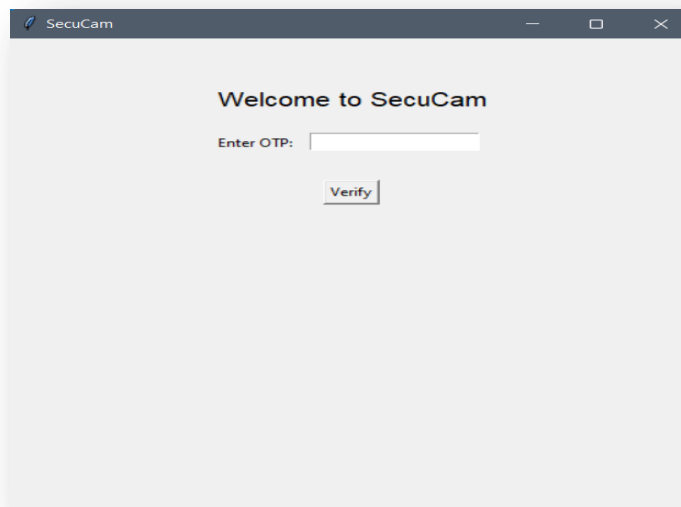
IV.   MODELLING AND ANALYSIS

Security Camera with motion detection is completely based on AI body and face detection. Here we have taken help of the python based "opencv" module. This module is very popular and robust for the same. Whenever a movement/ motion is detected, the data is processed by the opencv and is then sent to the system for further processing. Here onwards the system collects the data that has arrived and follows the further instructions i.e., an alarm is set off and an alert SMS is sent to the personnel responsible.

Fig 1: Proposed System

V.   RESULT AND DISCUSSION

When we start the application, it opens up the login page where we have to enter an 'otp' which has been sent on the designated email. The following GUI is shown. Which includes 2 text labels and one button and an entry box. At the start of the application a OTP is sent to the registered mobile number, which we have to verify.

After the otp verification the motion detection is applied to the connected camera and now the camera will look for any suspicious human activities.

If any movement is detected, that movement will be processed by Open-CV and the alarm will go off along with an alert notification to the user's mobile that some movement has been detected. It will also start recording after the movement is detected to see what exactly happened afterwards.
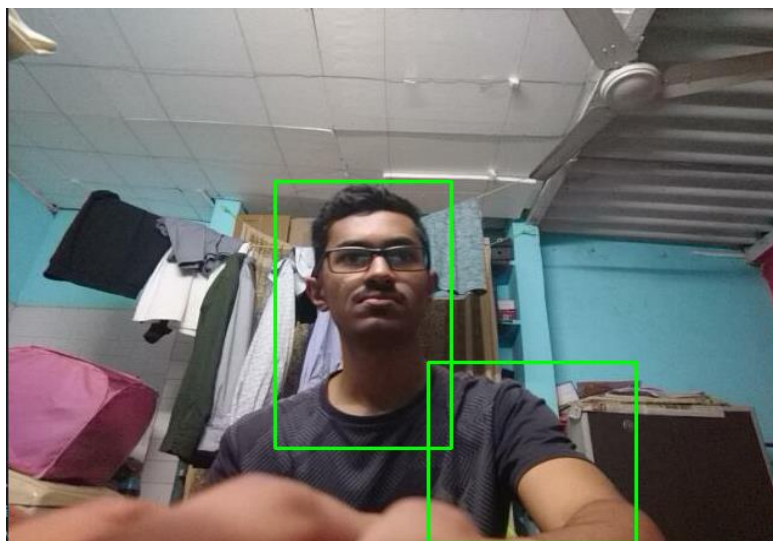
VI.   FUTURE SCOPE

There is always a possibility and extent for improvement in any application. In our application we can also implement the following features in the future:

- We can make this application a cloud application so that the user can access the camera from anywhere.
- We can give access of the automatic doors to this application so that when any movement is detected it automatically shuts the doors.
- Automatic signal to the local authorities can be implemented.

VII.   CONCLUSION

A simple and efficient motion detection system is proposed in this research work. This project supports the user to interact with the machine and made possible to access and extract information from the internet and our PC. The proposed model is useful due to its effective and user-friendly nature. It is technically free to use and very helpful in today's technology-dependent generation ensuring their security. Also, in a world that is full of technological advancements that ensure human comfort, a security motion detector is adding itself to this race. It could be extended further and improvised as per the user's requirements.

ACKNOWLEDGEMENT

VIII.   REFERENCES

[1] Suraiya Parveen, Javeria Shah "Motion Detection System in Python and OpenCV." IEEE, Feb 2021.

[2] Ahire Upasana, Bagul Manisha, Gawali Mohini, Khairnar Pradnya "Rea; Time Security System using Human Motion Detection" IJCSMC, Nov 2015

[3] J. Shankar Kartik. K. Ram Kumar, V. S. Srimadhavan " Security System with face recognition, sms alert and embedded network video monitoring terminal" IJSPTM, Oct 2013

[4] Alaeldden Abduelhadi, Mohmmed Elnour " Smart Motion Detection", IOSR- JEEE, May-June 2017

[5] Cynthia Tuscano, Blossom Lopes, Stephina Machado, Pradnya Rane, "Smart Web Cam Motion Detection Surveillance System" IJMER, March-April 2013

[6] AKM Jahangir, Alam Majumder, Joshua Aaron Izaguirre " IoT Security System for Smart-Home Using Motion Detection and Facial Recognition" IEEE, 2020

[7] Learning OpenCV 4 Computer Vision with Python 3: Get to grips with tools, techniques, and algorithms for computer vision and machine learning, 3rd Edition by Joseph Howse and Joe Minichino.

[8] OpenCV 4 for Secret Agents: Use OpenCV 4 in secret projects to classify cats, reveal the unseen, and react to rogue drivers, 2nd Edition by Joseph Howse.

[9] Machine Learning for OpenCV 4: Intelligent algorithms for building image processing apps using OpenCV 4, Python, and scikit-learn, 2nd Edition by Aditya Sharma, Vishwesh Ravi Shrimali.

[10] Learning OpenCV: Computer Vision with the OpenCV Library by Gary Bradski.