



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 3, March 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.488

 9940 572 462

 6381 907 438

 ijircce@gmail.com

 www.ijircce.com

Advanced Home Surveillance Using Open CV

Sangeetha M, Stefy Grace P, Preethi R

UG Student, Dept. of CSE, Sri Eshwar College Of Engineering, Kondampatti, Coimbatore, India

UG Student, Dept. of CSE, Sri Eshwar College Of Engineering, Kondampatti, Coimbatore, India

Assistant Professor, Dept. of CSE, Sri Eshwar College Of Engineering, Kondampatti, Coimbatore, India

ABSTRACT: There is no security for our houses/apartments in these days. Security is a major role for peaceful daily life. There are lot of thefts and lot of invasions, when we are not at our home. So for security reasons we designed this project named Advance home surveillance using open CV. Our project will be able to detect a human whether he/she is authorized to the place or not. If the person is an intruder, then the image of the intruder will be sent to the mobile application and if the intruder is a criminal it will alert user and the police.

KEYWORDS: OpenCV, Face Detection, Feature Extraction, API

I. INTRODUCTION

There are various Surveillance systems in these days such as camera, CCTV etc., But the security is not improving, but it's degrading. Because in these systems, the person located in their particular area can only view what is happening in that place. It needs man power to monitor them.

In recent years, computer vision has played a significant role in biometric identification and user recognition. Biometric identity primarily based totally safety structures are taken into consideration to be the maximum stable particularly because of their capacity to perceive humans with minimum ambiguity. Face Recognition can be performed with various algorithms which are feature based or model based. Mostly feature based algorithms are used in the security systems which are involved in real time.

We proposed a system to build a real time live streaming and monitoring system using system as prototype with installed Wi-fi connectivity. Here we are going to monitor the movements. Also we are going to detect unauthorized persons by using video cameras, information returned by using analyzed real time images. The test image should be compared with the database images and the classifier used in the algorithm decides which image is known and which image is unknown using the Euclidean algorithm, and the threshold value. The person will be categorized as unknown or unauthorized when the distance value exceeds the threshold. The computation effort, cost and resource requirements needed are significantly reduced.

II. RELATED WORK

This paper proposes a human detection robot which can operate in an environment which is not suitable for human intervention. The robot can operate manually with human input and is also capable of autonomous operation by being guided using sensors. The main objective of this paper is to provide a low cost human detection robot for countries human rescue missions in extreme situations.

This robot can operate flexibility in either manual input mode, automatic mode or stepping mode. During the manual mode, control commands are provided wirelessly. The automatic mode allows operation in areas beyond communication range. The sensors used in this project are cheap and easily available. This system is based on two level of human sensing in order to reduce power consumption and get higher efficiency in rescue missions.

The first level is PIR and IR sensors and the second level is an IP camera to confirm the existence of human in disasters. This two level human detection system make the robot more an IP camera to confirm the existence of human in disasters. This two level human detection system make the robot more reliable for rescue missions. Practical experiments and simulation experiments are carried out to validate our design.

III. PROPOSED ALGORITHM

A. Module Designs:

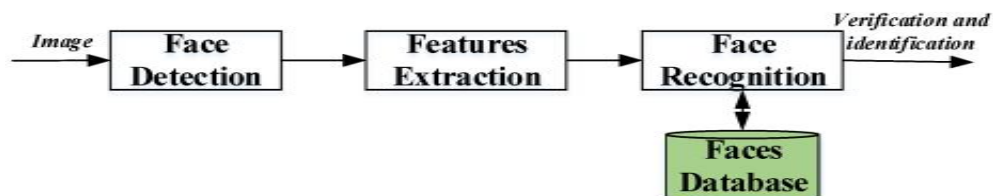
- Importing the authorized person images into dataset folder
- Capturing the video feed and converting into the frames for analysing
- The processed image is compared with the dataset using open CV
- If the intruder is detected, then the image is sent to cloud.
- The result will be displayed in the mobile application.

B. Description of the Proposed Solution:

- **Importing the authorized person images into dataset folder :**

Face Detection: First step for the face recognition system is localizing human faces in a particular image. The objective of this step is to determine whether the input image contains human faces or not. The variations of lighting and facial expression can prevent from proper face detection. In order to improve the design of a further face recognition system and make it more robust, pre-processing steps are performed. Variety techniques are used to detect and locate the human face image, for example, Viola–Jones detector, histogram of oriented gradient (HOG), and principal component analysis (PCA). Also, the face detection step can be used for video and image classification, object detection, region-of-interest detection, and so on

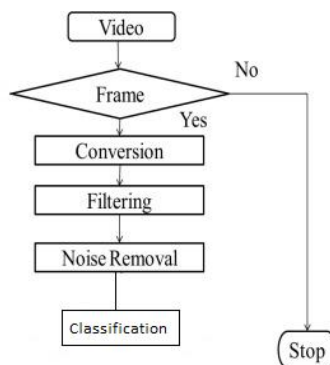
Feature Extraction: The main function of this step is to extract the features of the face images detected in the detection step. This step represents a face with a set of features vector called a “signature” that describes the prominent features of the face image such as mouth, nose, and eyes with their geometry distribution. Each face is categorized by its structure, size, and shape, which allow it to be identified. Several techniques involve extracting the shape of the mouth, eyes, or nose to identify the face using the size and distance. HOG, Eigenface, independent component analysis (ICA), linear discriminant analysis (LDA), scale-invariant feature transform (SIFT, gabor filter, local phase quantization (LPQ), Haar wavelets, Fourier transforms, and local binary pattern (LBP) techniques are widely used to extract the face features.



- **Capturing the video feed and converting into the frames for analysing :**

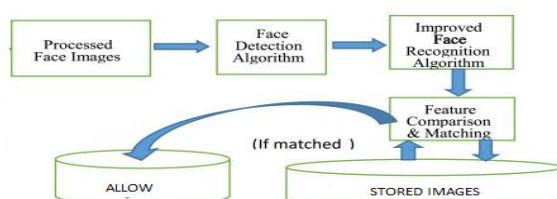
Processing a video means, performing operations on the video frame by frame. Frames are nothing but the particular moment of the video in a single point of time. We have multiple frames or images even in a single second. Frames are similar to a picture or an image. The operations we can perform on the images can be performed on the frames as well.

The primary technical issues related to performance in real-time streaming video image processing performance are to create low-latency paths in the hardware, operating system, and application software to achieve an acceptable frames-per-second (fps) rate. There are several stages of processing required to make the pixels captured by a camera visible on a video display. The delays contributed by each of these processing steps produce the total delay, known as end-to-end latency. But, the biggest contributors to video latency are the processing stages that require temporal storage of data (i.e. buffering), colour space conversion (encoding) and image processing. Converting from frames to time depends on the video’s frame rate. Several filters like gaussian and noise removal technique is applied for better classification of face.



- **The processed image is compared with the dataset using open CV :**

This step considers the features extracted from the background during the feature extraction step and compares it with known faces stored in a specific database. There are trendy programs of face recognition, one is referred to as identification and another one is referred to as verification. During the identification step, take a look at a face is in comparison with a fixed of aiming to discover the maximum probably match. During the verification step, a test face is compared with a known face in the database in order to make the acceptance or rejection decision. Correlation filters (CFs), convolutional neural network (CNN), and also k-nearest neighbour (K-NN) are known to effectively address this task. All these jobs are done using Open cv Package.



- **If the intruder is detected, then the image is sent to cloud :**

If the intruder detected then the image is captured and the image is sent to cloud using secret access token and stored according to date and time when the intruders is detected.

- **The result will be displayed in the application :**

The stored image from the drop box cloud is then fetched through API link and the link is mounted to a html button and cross compiled to android application which can be viewed by the user at any time.

IV. SIMULATION RESULTS

Efficient and intelligent output design improves the system’s relationship to help user decision-making. The output form of an information system should accomplish one or more of the following objectives. Convey information about past activities, current status or projections of the Future. Signal important events, opportunities, problems, or warnings. After cropping out the face region, we performed histogram equalization so also avoid illumination change. Its used to verify the user face and body recognition and compare sample gallery then its give valid results to make correct decision its verifies the valid user or invalid user using the frontal face images captured by an embedded HOME SURVEILLANCE camera.

V. CONCLUSION AND FUTURE WORK

This project finally delivers a prototype for human intruder detection operation using open CV systems in an environment which is unsuitable for any human intervention. The robot can operate automatically with human input as a dataset The designed software system is compact and it has the main feature of wireless transmission and reception of data using the inbuilt Wi-Fi module that can be controlled and viewed image through cloud.

In the future work the system is executed in real time hardware components with designing and building a webpage based on control of a mini size robot by using raspberry pi. In case of a situation where humans cannot able to move in



the particular places so that the robot can roam around in a given environment while transmitting back real time video data to the manually hosted webpage, also the program can be invoked through SSH (Secure Shell) connection (wireless real-time programming).

REFERENCES

1. J. Sreemathy, I. Joseph V., S. Nisha, C. Prabha I., and G. Priya R.M., "Data Integration in ETL Using TALEND," 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS), Mar. 2020.
2. V. Niranjani and N. S. Selvam, "Overview on Deep Neural Networks: Architecture, Application and Rising Analysis Trends," EAI/Springer Innovations in Communication and Computing, pp. 271–278, 2020.
3. Poonkodi.R, N. Saravana Selvam, 'Implementation of Wireless Sensor's Integration Possibilities and Attacks on Wireless Network Control', International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878 (Online), Volume-8 Issue-4, November 2019.
4. P.Chitra R.Geethamani T.C.Manjunathi, "Sentiment analysis of product feedback using natural language processing", Materials Today: Proceedings, Elsevier (Online), DOI.org/10.1016/j.matpr.2020.12.1061
5. P. John Augustine, K. Bommanna Raja, "M-Tree based on the Fly Automatic Webpage Adaptation for Small Display Device" published 2016 in Asian Journal of Research in Social Sciences and Humanities volume 6 issue 10 on page 2030.



INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor:
7.488

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 9940 572 462  6381 907 438  ijircce@gmail.com



www.ijircce.com

Scan to save the contact details