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Face Recognition and Motion Detection Using CCTV Surveillance

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ABSTRACT: In Today's world, security is one of the major concerns of every household owner, shop owner or any office owner. The acts of theft and robbery are growing each day resulting in huge loss to such owners. The use of CCTV cameras has played a huge role in helping the owners to know who the intruder was. The potential of image processing can be used to enhance the role of CCTV cameras to generate an alert to the concerned owners or the police officials whenever an intruder is detected in the owners' area. The project aims at developing a security alert system based on motion detection and face recognition techniques in image processing. The frames captured by the camera are analyzed to detect the presence of any motion and if the motion is detected for a particular time frame, the intruder's face is matched with the authorised database of persons provided by the owner of the place using face recognition techniques. If the intruder's face is not matched with any other in the database, an alarm is generated and the intruder's image is sent to the concerned owners and security officials.

KEYWORDS: CCTV, frames, image processing

I. INTRODUCTION

Often, students find themselves creating a wrong career selection that they regret later and can't do a lot of concerning it. to form certain you are taking a rational and well-thought call, we tend to accompany the three biggest challenges you'll face. Lack of Guidance: each student has his or her power and career preference and thence desires bespoke counsel. There are few reliable career steering counsel mentors, websites, or physical centers that investigate this facet. Peer and Parent Pressure: you feel that your peers are creating the proper career selection, or your folks understand what's best for you. To contend with your friends or make your folks happily, you finish up with a wrong career. Salary-Driven Decisions: several students opt for a career supported however well it'll pay or whether or not it will land you a distant job. There can't be an additional irrational logic than this parameter to decide your career. You think that a high package or offshore employment is the key to your career success or satisfaction. Well, that's not true. "Krishna – The Career Guidance ChatBot" helps the scholars steer education and career.

II. MODULE IDENTIFICATION

1. Pre-Processing: To reduce the variability in the faces, the images are processed before they are fed into the network. All positive examples that is the face images are obtained by cropping images with frontal faces to include only the front view. All the cropped images are then corrected for lighting through standard algorithms.
2. Classification: Neural networks are implemented to classify the images as faces or nonfaces by training on these examples. We use both our implementation of the neural network and the neural network toolbox for this task. Different network configurations are experimented with to optimize the results.
3. Localization: The trained neural network is then used to search for faces in an image and if present localize them in a bounding box. Various Feature of Face on which the work has done on:- Position Scale Orientation Illumination

III. SCOPE

Motion sensor and face recognition surveillance camera is a system where the camera will be in sleep mode, when the PIR sensor start sensing any kind of motion the camera starts automatically and starts face recognition. It checks the face with the pictures present in the database for authentication. If the face is not matched with the database then he is unauthorized and the buzzer starts buzz ring including the message/mail services to the owners.

IV. RELATED WORK

The paper [1] discusses about the detection of motion in a monitored area by using the frame difference methods. The technique discussed in the paper is based upon the combination of two different frame differencing methods which are the Background subtraction method and Consecutive frame subtraction method. The technique is based upon the background images acquired from the previously captured frames. The current image is compared pixel by pixel to an image which is actually the mean of the background images taken. The motion is detected by analyzing the difference in the pixel value of the current image with respect to the background images and the difference in pixel values is then checked against a threshold value. If the difference is greater than the threshold value set by the user, it can be inferred that the motion is detected in the current camera frame else if the difference is less than the threshold, the current image is not detected with the presence of any motion and the system analyzes the next image for motion. Finally the motion detection is indicated by an alarm or by using a graphical method. The technique is implemented using Matlab and the results obtained depicts that the methods leads to avoidance of false positive alarms but the amount of time required to train the system to avoid false alarms is very high which is a limitation to this technique. The improvement that can be done is to use machine learning algorithms which can help learn the system at a faster pace and the limitation to this system is overcome.

The paper [2] proposes computer vision techniques that can be used to design a visual surveillance home security system to protect against intrusions and theft. The paper discusses about using the combination of motion detection and face recognition techniques to build the system. The motion detection module uses frame difference methods to detect the presence of motion in the frame. The current frame is compared with the previous frames pixel wise. The difference in pixel values is noted and used to detect motion. If the difference is greater than 15 percent from a set threshold value, then it indicates that the motion has been detected and it triggers the face recognition module. The face recognition module uses the Eigen face recognition algorithm to recognize faces. The face detection module differentiates the intruders from the authorized users. A database of authorized users is provided by the owners of the property. If a person is detected and his face is not recognized in the authorized person's database, it indicates that the person can be an intruder or thief and alarm is triggered and an email is generated to notify the owners about the intrusion. The system is tested during day and night at various times and it was noted that the system is less responsive during night time to capture motion and the recognition rate is not high enough. Still the system is highly robust, reliable and efficient. The system can be improved by making the face recognition module less sensitive to variations in light intensity and increasing the recognition ratio.

V. CONCLUSION

The main aim of this project is to provide security to the people and make them feel safe. As this automatic on and off camera power consumption is very less and cost efficient. Security these days plays a crucial role but the cost of maintaining it also increases with lots of power consumption, to avoid this problem automatic on and off of camera using PIR sensor is useful.

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