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Smart CCTV Surveillance Using Face Recognition and Face Detection

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ABSTRACT: Face acknowledgment is a standout amongst the most difficult subjects in PC vision today. It has applications running from security and observation to amusement sites. Face acknowledgment programming are valuable in banks, airplane terminals, and different organizations for screening clients. Germany and Australia have conveyed confront acknowledgment at outskirts and traditions for Automatic Passport Control. Human face is a dynamic protest having high level of fluctuation in its appearance which makes confront acknowledgment a troublesome issue in PC vision. In this field, precision and speed of ID is a principle issue. Numerous difficulties exist for confront acknowledgment. The power of the framework can be blocked by people who change their facial highlights through wearing hued contact focal points, growing a mustache, putting on serious make-up, and so on. Moral concerns are additionally identified with the way toward recording, contemplating, and perceiving faces. Numerous people don't endorse of observation frameworks which take various photos of individuals who have not approved this activity. The objective of this paper is to assess confront discovery and acknowledgment procedures and give a total answer for picture based face location and acknowledgment with higher exactness, better reaction rate and an underlying advance for video observation. Arrangement is proposed in light of performed tests on different face rich databases as far as subjects, stance, feelings and light.

KEYWORDS: Face Recognition, Face Detection, Arduino, Text Detection.

I. INTRODUCTION

Face recognition is the task of identifying an already detected object as a known or unknown face. Often the problem of face recognition is confused with the problem of face detection. On the other hand is to decide if the "face" is someone known, or unknown, using for this purpose a database of faces in order to validate this input face. This project main objective is to create an efficient architecture for face recognition in playing videos using Neural Network. This product which two self contained Neural Network (CNNs) which are used to detect and recognize faces in regions containing a dense grouping of features from Accelerated Segment Test (FAST).

Criminal Detection through Face Recognition is a challenging problem in the field of image processing. Images, acquired from different sources may be sensitive to noises and lighting conditions. Detection of face from noised and low resolution is difficult task.To solve these problems, there is need to perform some preprocessing techniques. Preprocessed images are helpful to get better accuracy and to improve face recognition performance of the system.

II. RELATED WORK

In the modern world, security is one of the main concerns. There is significant rise of threats to the society with increasing rate of crimes and terrorist activities.

Even have many ways of identifying a person, Finger print recognition, voice recognition, Iris and voice recognition are the approaches of biometric identification. It also useful in footages taken by surveillance and application. This project is aimed to identify the criminal faces

The main objective of our project is to show matched faces in input images and in playing video so this type of application can be useful in security. By this project we are going to match any other contents of images into videos. Propose system are going to matches faces into uploaded images.

III. BLOCK DIAGRAM DESCRIPTION
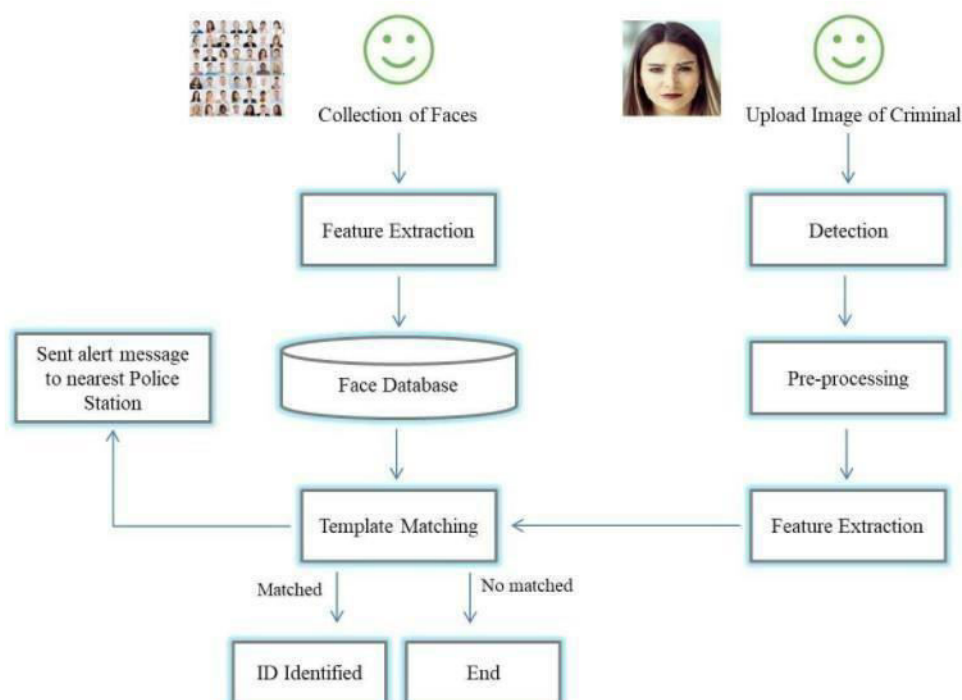
To Load the face detection cascade the first step is to detect the face in each frame. Once we get the region of interest containing the face in the image, we use it for training the recognizer. For the purpose of face detection, we will use the Haar Cascade provided by OpenCV. The haar cascades that come with OpenCV are located in the directory of OpenCV installation. Haar cascade frontal face default.xml is used for detecting the face. Cascade is loaded using the cv2 Cascade Classifier function which takes the path to the cascade xml file. If the xml file is in the current working directory, then the relative path is used.

The next step involves creating the face recognizer object [4]. The face recognizer object has functions like FaceRecognizer. train() to train the recognizer and FaceRe cognizer.predict() to recognize a face. OpenCV currently provides Eigenface Recognizer, Fisherface Recognizer and Local Binary Patterns Histograms(LBPH) Face Recognizer [4]. We have used LBPH recognizer because Real life isn't perfect. We simply can't guarantee perfect light settings in your images or 10 different images of a person. LBPH focus on extracting local features from images. The idea is to not look at the whole image as a high dimensional vector but describe only local features of an object. The basic idea of Local Binary Patterns is to summarize the local structure in an image by comparing each pixel with its neighbourhood.

IV. SOFTWARE AND HARDWARE DESCRIPTION

A. *System Developed::*

ARDUINO UNO

Arduino is an open-source electronics software. This makes platform-based software and also easy-to-use. Arduino take the data from the user and according to that it gets further operations such as read the inputs - light on a sensor, a finger on a button, and turn it into output by activating a motor or turning on an LED, We can design any circuit on board. By sending the information or instructions to the device, and then according to this it works. To do so we can use the Arduino programming language, and the Arduino Software (IDE), based on Processing free of cost.
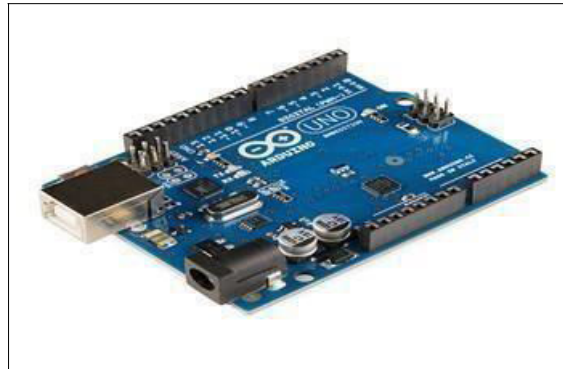
Figure 4.1: Arduino

Figure 4.1: Arduino

CAMERA

The camera module is a portable light weight camera that supports microcontroller. It communicates with microcontroller using the MIPI camera serial interface protocol. It is normally used in image processing, machine learning or in surveillance projects. It is commonly used in surveillance drones since the payload of camera is very less.

Figure 4.2: Camera

POWER SUPPLY

The power supply is the first and most important part of our project. For our project, we require a +5v regulated power supply with a maximum current rating of 500mA.

The 1000μF capacitor serves as a "reservoir" which maintains a reasonable input voltage to the 7805 throughout the entire cycle of the AC line voltage. The 10μF and .01μF serve to keep the power supply voltage constant when load condition changes. However, at high frequencies, this capacitor is not very efficient therefore the .01μF is included to bypass high-frequency changes such as digital IC switching effects, to ground.

The ac voltage, typically 220V, is connected to a transformer, which steps down that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also retains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes.
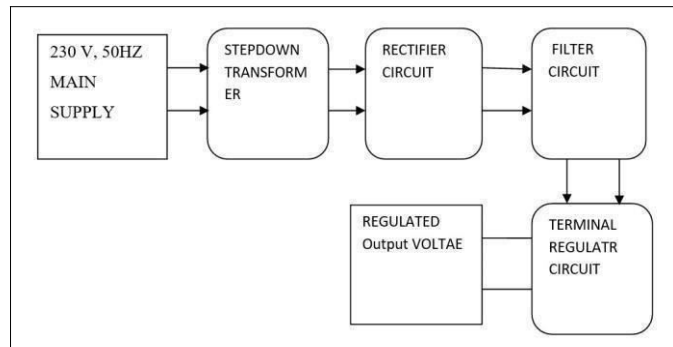
Figure 4.4: Power Supply

IDE : ARDUINO

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards. Userwritten code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.
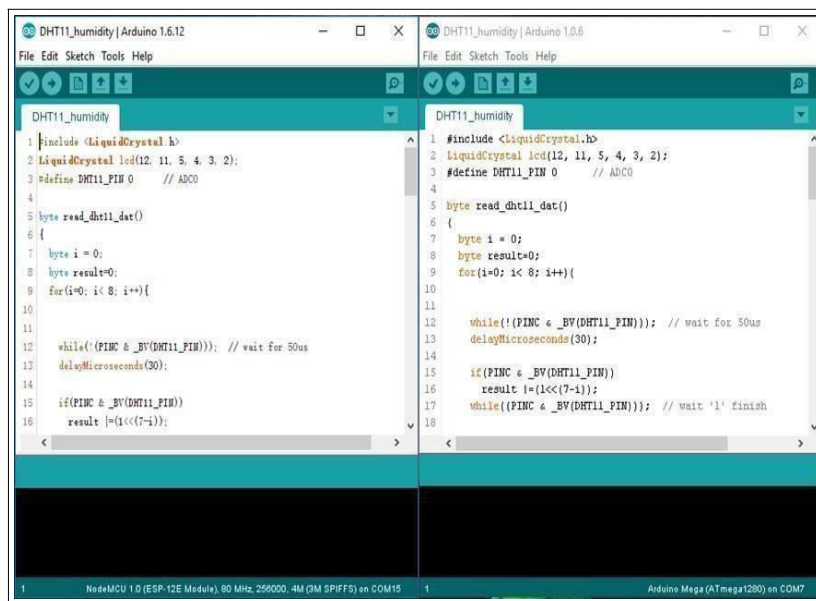

Figure 4.7: Arduino IDE

IV. SIMULATION RESULTS

We have proposed Face recognition using Fisherfaces and Neural Network. The system aims to find solutions for a robust method for face recognition from videos, reducing the time requirements for face recognition with introduction of Fisherfaces on key frames. This system provides better approach to detect criminal The system demonstrate various concerns related to the face recognition process, such as the lighting and background condition in which the facial images are taken.
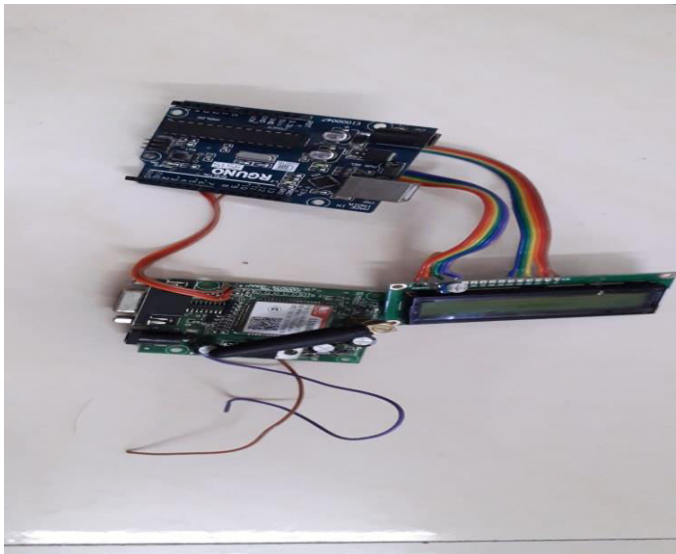
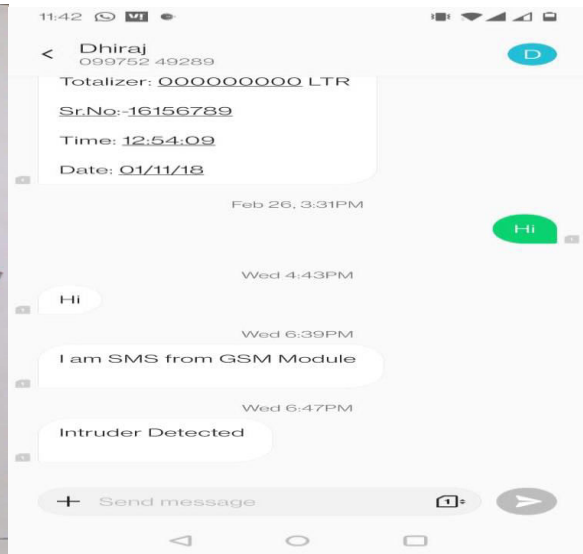Fig. Hardware Picture   Fig. Message send to Owner

VI. CONCLUSION AND FUTURE WORK

We have proposed Face recognition using Fisherfaces and Neural Network. The system aims to find solutions for a robust method for face recognition from videos, reducing the time requirements for face recognition with introduction of Fisherfaces on key frames. This system provides better approach to detect criminal The system demonstrate various concerns related to the face recognition process, such as the lighting and background condition in which the facial images are taken.The system can be enhanced with use of new algorithms with different models and classification.

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