REAL-TIME MONITORING OF SMART CAMPUS FOR ENTRY EXIT DETECTION USING MATLAB

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1. ABSTRACT

India has many numbers of colleges and teaching is one of the major activities providing employment to number of people who like to give knowledge to the people. Today many colleges of rural area are facing common problem like bunking the college lectures also meet with the accidents. Indian department of education arises question to the department for their irresponsibility. Education department also seeks records of all the students which are very difficult to maintain. This describes a prototype development of maintain the record of all the students titled face detection in the campus to find the students who are went out illegal. Our system gives 24*7 monitoring around the college campus area. If any students bunk the class or exit on the night time from the hostel. Matlab(image processing) and embedded systems gives the solution for this activity, our system sends the details of the particular person who exit the campus, GSM Module will communicate with the respective authority person and parents with campus alarm sound. Face recognition systems are progressively becoming popular as means of extracting biometric information. Face recognition has a critical role in biometric systems and is attractive for numerous applications including visual surveillance and security. Because of the general public acceptance of face images on various documents, face recognition has a great potential to become the next generation biometric technology of choice. Face images are also the only biometric information available in some legacy databases and international terrorist watch-lists and can be acquired even without subjects' cooperation.

2. 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 detectionFace Recognition 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.

3. LITERATURE SURVEY

M. Hassan Shirali-Shahreza "An Anti-SMS-Spam Using CAPTCHA".Today sending spam has turned to be a major problem in the Internet. In last 20 years, the Internet and mobile communication growth in parallel. So the spam are also born on the mobile phones as the form of SMS (Short Message Service) spam. In this paper a new method is proposed for filtering SMS spam

using CAPTCHA (Completely Automatic Public Turing Test to Tell Computer and Human Apart) systems. CAPTCHA systems are used to distinguish between human users and computer programs automatically. In this method, the picture of an object is sent as an SMS picture message.

IN[2] **Jae Young Choi, Yong Man Ro "Color Face Recognition for Degraded Face Images" 2018**. In many current face- recognition (FR) applications, such as video surveillance security and content annotation in a web environment, low-resolution faces are commonly encountered and negatively impact on reliable recognition performance. In particular, the recognition accuracy of current intensity-based FR systems can significantly drop off if the resolution of facial images is smaller than a certain level (e.g., less than 20 × 20 pixels). To cope with low-resolution faces, we demonstrate that facial color cue can significantly improve recognition performance compared with intensity-based features. The contribution of this paper is twofold. First, a new metric called "variation ratio gain" (VRG) is proposed to prove theoretically the significance of color effect on lowresolution faces within well-known subspace FR frameworks; VRG quantitatively characterizes how color features affect the recognition performance with respect to changes in face resolution. Second, we conduct extensive performance evaluation studies to show the effectiveness of color on low-resolution faces. In particular, more than 3000 color facial images of 341 subjects, which are collected from three standard 6 face databases, are used to perform the comparative studies of color effect on face resolutions to be possibly confronted in real-world FR systems.

IN[3] **G. C. Feng and Pong C. Yuen "Recognition of Head-&-Shoulder Face Image Using Virtual Frontal-View Image"2018**. This paper addresses the problem of face recognition under varying poses. To recognize a face under different poses, one approach is to use a human face three-dimensional (3-D) model. This approach is flexible but the equipment for acquiring the 3-D face image is very expensive. The second approach is view-based. However, the complexity of the system is very high, as it requires constructing a representation for each view. For a 3-D rotation, construction of dozens of representations may be required. This paper proposes a new idea to transform the face with unknown pose into frontal-view for recognition. To construct the virtual frontal view image, we have developed an algorithm for detecting facial landmarks, which are then used to estimate the orientation of the face. A generic 3-Dspring-based face model is developed to transform the unknown face image into virtual frontal-view image. Finally, a spectroface method, which is based on wavelet transform and Fourier transform, is developed to recognize the virtual frontal face image. The proposed method has been tested by 1145 face images from 85 persons with different poses, facial expressions and small occlusions. The recognition accuracy for the best match is 84.7%.

IN[4] **Seung Ho Lee, Jae Young Choi, Yong Man Ro, and Konstantinos N. Plataniotis"Local Color Vector Binary Patterns From Multichannel Face Images for Face Recognition" 2019.** This paper proposes a novel face descriptor based on color information, i.e., so-called local color vector binary patterns (LCVBPs), for face recognition (FR). The proposed LCVBP consists of two discriminative patterns: color norm patterns and color angular patterns. In particular, we have designed a method for extracting color angular patterns, which enables to encode the discriminating texture patterns derived from spatial interactions among different spectral-band images. In order to perform FR tasks, the proposed LCVBP feature is generated by combining multiple features extracted from both color norm patterns and color angular patterns. Extensive and comparative experiments have been conducted to evaluate the proposed LCVBP feature on five public databases. Experimental results show that the proposed LCVBP feature is able to yield excellent FR performance for challenging face images. In addition, the effectiveness of the proposed LCVBP feature has successfully been tested by comparing other state-of-the-art face descriptors.

4. HARDWARE AND SOFTWARE REQUIREMENRTS

- **HARDWARE REQUIREMENTS**
  - ARDUINO
  - BUZZER CIRCUIT
  - GSM MODEM
- **SOFTWARE REQUIREMENTS**
  - MATLAB
  - C
  - C++
  - JAVA
  - .NET

5. SYSTEM COMPONENTS DESCRIPTION

ARDUINO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output, 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino . The Uno and version will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards for a comparison with previous versions.

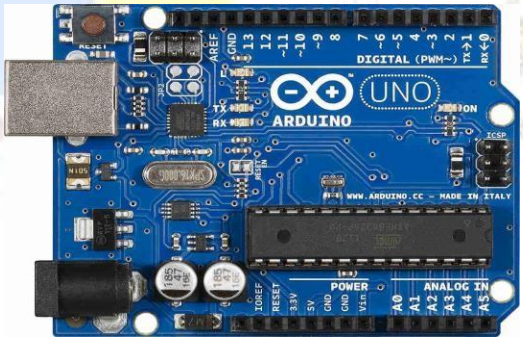


Fig.5.1. ARDUINO

BUZZER

A buzzer or beeper is a signaling device, The word "buzzer" comes from the rasping noise that buzzers made when they were electromechanical devices, operated from stepped-down AC line voltage at 50 or 60 cycles. Other sounds commonly used to indicate that a button has been pressed are a ring or a beep.

Fig.5.2. BUZZER

GSM MODEM

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHZ. A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. Originally GSM had been planned as a European system. However the first indication that the success of GSM was spreading further a field occurred .

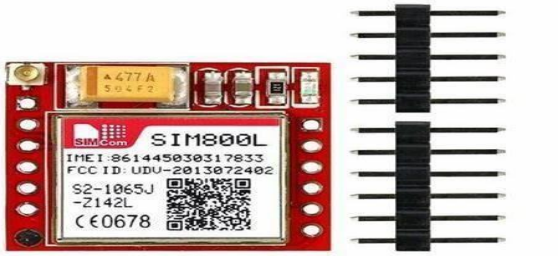
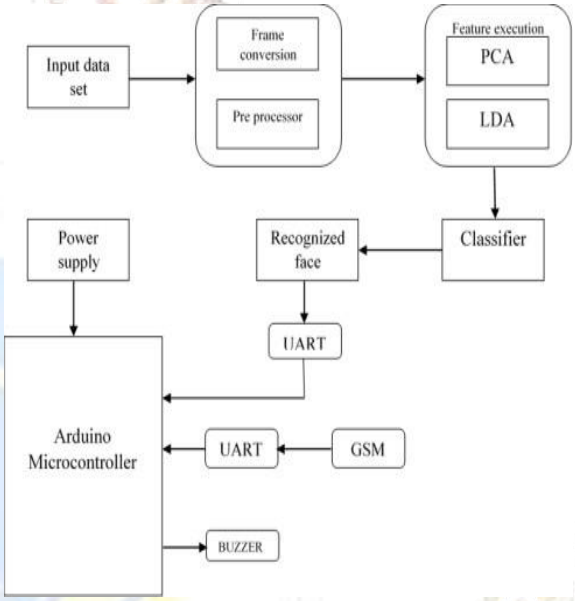


Fig.5.3. GSM MODEM

6. BLOCK DIAGRAM



7. KEY FEATURES

- Supervised networks, including multilayer, radial basis, learning vector quantization (LVQ), time-delay, nonlinear autoregressive (NARX), and layerrecurrent.
- Apps for data-fitting, pattern recognition, and clustering.
- Preprocessing and post processing for improving the efficiency of network training and assessing network performance.
- Simulink blocks for building and evaluating neural networks and forcontrol systems applications.

8. PROCESS MODEL

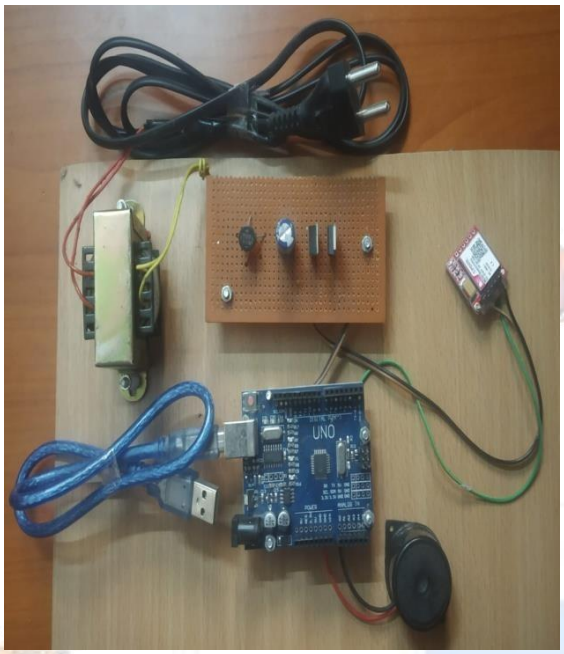


Fig.8.1. Connectivity image

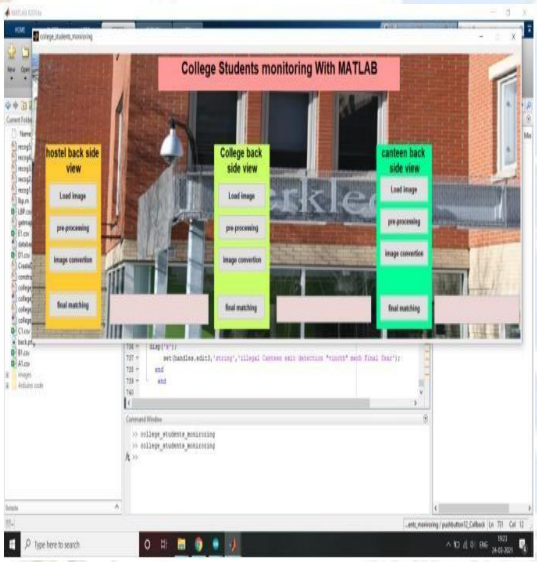


Fig.8.2. Representative model

9. RESULT AND OUTPUT

Image processing is a form of signal processing, which uses image as input and output. Generally, an image can be of two or three dimensional array. In MATLAB, this array or matrix is manipulated. The picture shown below defines you the several stages of image processing in MATLAB. The final stage of image processing is the machine control in which a robot is controlled according to the details obtained from image analysis. For example, if a robot needs to identify a ball, it captures images in front of it, sends it to PC, and analyses it with the MATLAB program. If the image input and program output are satisfied, then it detects it as a ball. Otherwise, it goes on searching for a ball by this method.

10. CONCLUSION

In case any student tries to exit from the campus on night times or college working hours, we detect the face of the particular person and intimates to teachers and parents. Both hardware and software are used here to implement the system, GSM module connected with the microcontroller to send the SMS.The system with manual face detection and automatic face recognition did not have a recognition accuracy over 90%, due to the limited number of eigenfaces that were used for the PCA transform. The fully automated frontal view face detection system displayed virtually perfect accuracy and in the researcher's opinion further work need not be conducted in this area. The fully automated face detection and recognition system was not robust enough to achieve a high recognition accuracy.

11. REFERENCES

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