Terrorist attack security and soldier health monitoring system

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ABSTRACT

Nation security is dependent on its defense system. The army is one of the defense systems. In this days terrorism increases and it focuses on soldiers' destruction to make countries' defense system weak. So, in this case, it is necessary to provide more security to military base station and soldiers. These all things keeping in mind this project is built. The project works for defending any unauthorized person to enter in the military area with Pi-camera, IoT server and wireless communication it will provide 24-hour security and attacks on military base station will be controlled. Along with this, sensors like heartbeat sensor and temperature sensor is used for daily fast routine checkup of soldiers

Keywords— *Raspberry Pi, Pi-camera, Image processing system, IoT server, Database*

1. INTRODUCTION

Nowadays terrorism is a major problem. Terrorists specifically attack military area so soldiers' security is a major concern. Many solutions are there to control these attacks so we are making efforts to find one of the solutions. Many times terrorist enter in the military area and every time it could not become possible to immediately aware soldiers about this. Terrorist can come with soldiers' attire so it is difficult for a human to recognize them from a number of soldiers. To avoid this situation this project is built. Images of all soldiers and an authorized person will be captured with Pi-camera in advance and database is created. Hi-tech Pi-cameras installed everywhere in the military area. It will take real-time pictures all the time with the face detection algorithm. Through IoT server, these pictures will be sent to the database and will be compared previously taken images of soldiers' database. If any person's face does not match with previously stored database through email it will be notified to authorize person immediately. And then soldiers will be awarded about the situation and necessary action can be taken in immediate time.

Sometimes soldiers' health condition could be avoided so soldier health security is important to concern. For this, with this system, some sensors like heart bit sensor, temperature sensor and humidity sensor are used for daily routine checkup of a soldier.

1.1. Literature Review

This project can be designed with minimum no. of components. This can contribute to the safety of military areas and soldiers by making security system more advanced and more automatic. Awareness within soldiers will be increased with this project.

The moto behind this project is to take images of all humans present in particular area with face recognition algorithm sent it to the database with the IoT server and compare these images with previously stored known images. This project is similar to a robot system were using an image processing system can do surveillance of border so no one can enter from the border. But this project will take care if any person enters somehow in a military base station other from authorized one, it will notify immediately.

1)'Border security using IoT' Pooja S N, Rashmi R K, Spruthi T M, Samreen Unisa, Deepika J, International Journal of Engineering Research & Technology issue-2018. The objective of this project was to develop a system robot which will monitor the border if any human presence is detected it will capture an image from the pi camera and send it to the military. The soldier will recognize the image and give orders to the system. The system gets orders to a shootout it will shootout otherwise the operation is left.

1.2. System overview

In this terrorist attack security system, Pi camera and different sensors are connected to the Raspberry Pi module. The Pi camera is used to take real-time pictures of persons in a particular area. Around 20 pictures of one soldier are already taken from different angles. These images are stored in the database. Hence whenever any person is captured in a camera this image is compared with the already set database of all the soldier with the help of IOT sever. 50% threshold is given to each image. If this captured image is not compared with above 50% to any of the image of any of the soldier immediate e-mail notification is given to the authorized person that unknown person is detected.

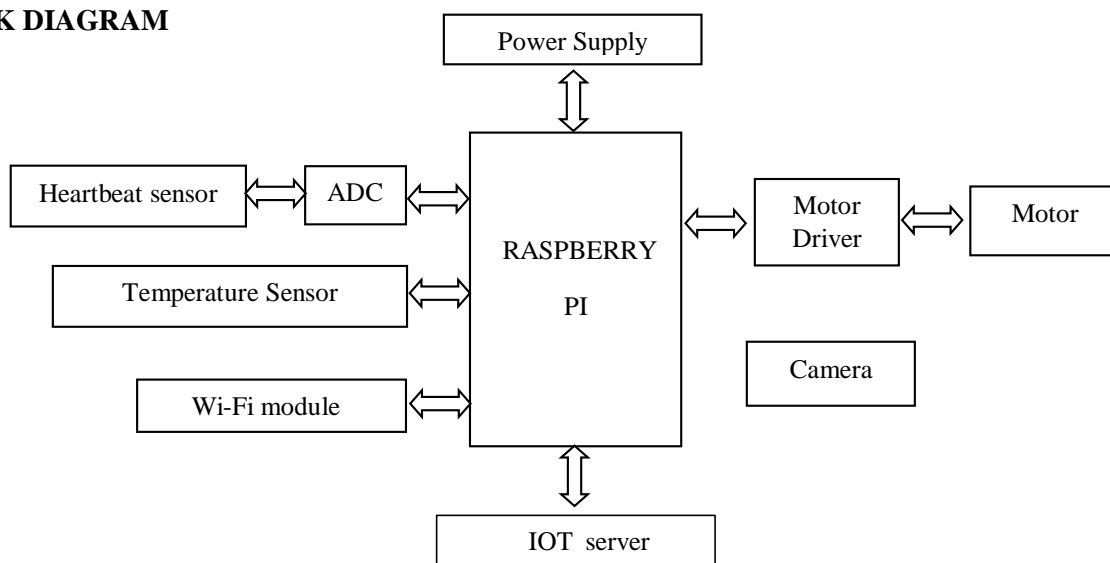Heart bit sensor, Temperature sensor and humidity sensor are used for a routine check-up of a soldier.

1.3. Hardware resources used
(a) Raspberry Pi
(b) Temperature Sensor
(c) Heartbit sensor
(d) Motor

1.4. Software resources used
(a) VNC server
(b) RPI OS
(c) Proteus

2. BLOCK DIAGRAM

F**ig. 1: Block diagram of the system**

2.1. Raspberry Pi

Processor: Broadcom BCM2387 chipset.1.2GHz Quad-Core ARM Cortex-A53 (64Bit) 802.11 b/g/n Wireless LAN and Bluetooth 4.1 (Bluetooth Classic and LE). IEEE 802.11 b / g / n Wi-Fi. Protocol: WEP, WPA WPA2 algorithms AES-CCMP (maximum key length of 256 bits), the maximum range of 100 meters. IEEE 802.15 Bluetooth, symmetric encryption algorithm Advanced Encryption Standard (AES) with a 128-bit key, the maximum range of 50 meters. Dual Core Video Core IV® Multimedia Co-Processor. Provides Open GL ES 2.0, hardware-accelerated Open VG, and 1080p30 H.264 high-profile decode. Capable of 1Gpixel/s, 1.5Gtexel/s or 24GFLOPs with texture filtering and DMA infrastructure Memory.

2.2. Pi-camera

The Pi camera module is high-quality 5-megapixel module designs, especially for Raspberry Pi. It can capture still images or can record video like a camcorder. It is useful in this system to capture back to back images. Hence it gives real-time images with good quality. Specifications: Connection type: USB
Resolution: 2592×1944
Image capture: 640×480, 5MP
Frame rate (Max): 640×480@30

2.3. Sensors

Table 1: Information about sensors

Heart bit sensor	Temperature sensor
This sensor is used to measure the heart bit of soldier and display the result on LCD	This sensor is used to measure the temperature of the human body and display the result on LCD
Working voltage is 5-volt dc	Operated from 4V to 30V Calibrated directly in Celcius
Heart bit sensor provides the digital output of Heart bit when the finger is placed on it	Linear output, precise inherent calibration of LM35 makes interfacing of control circuitry easy

2.4. Database
As in our computer system, we have a set of images, those images are of authorized persons from front view back view left angle view and right angle view. Those images set are the face of persons. We are using a MySQL database to store the details of the person. MySQL is the world's most popular open source database, which is used for storing particular data.

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
           ┌──────────────────────────────┐
           │   Initialize camera module   │
           └──────────────────────────────┘
                           │
           ┌──────────────────────────────┐
           │       Start GPIO pins        │
           └──────────────────────────────┘
                           │
           ┌──────────────────────────────┐       ┌────────────────────────────────────┐
           │     Start camera program     │       │  Get Heartbeat and Temperature data │
           └──────────────────────────────┘       └────────────────────────────────────┘
                           │                                        │
           ┌──────────────────────────────┐       ┌────────────────────────────────────┐
           │         Capture face         │       │ Display Heartbeat and Temperature data│
           └──────────────────────────────┘       └────────────────────────────────────┘
                           │                                        │
           ┌──────────────────────────────┐       ┌────────────────────────────────────┐
           │     Match with database      │       │            Rotate motor            │
           └──────────────────────────────┘       └────────────────────────────────────┘
                           │
                     ◇ Face Match ◇
                           │   No
           ┌──────────────────────────────┐
           │         Set up mail          │
           └──────────────────────────────┘
                           │
           ┌──────────────────────────────┐
           │          Send mail           │
           └──────────────────────────────┘
```
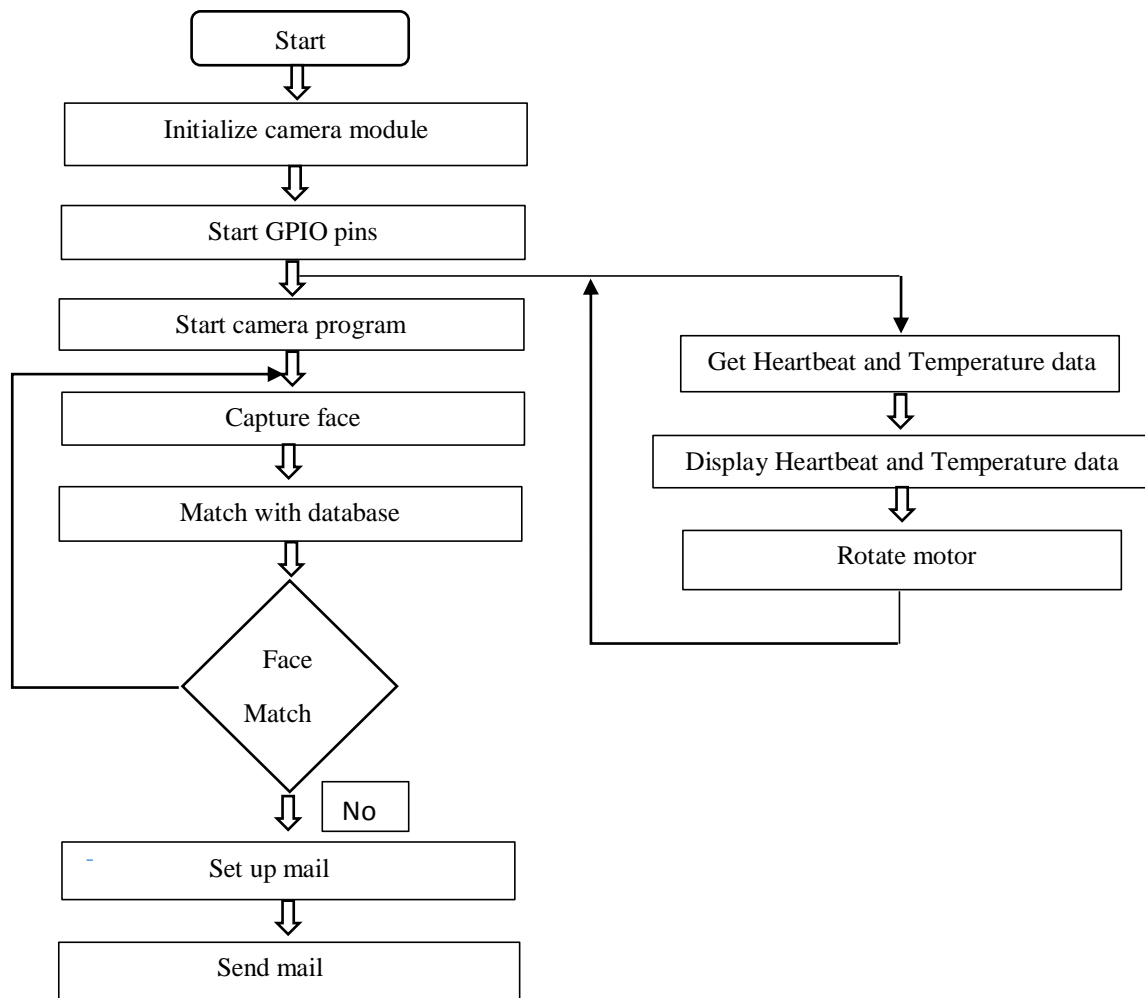
Fig. 2: Flow chart

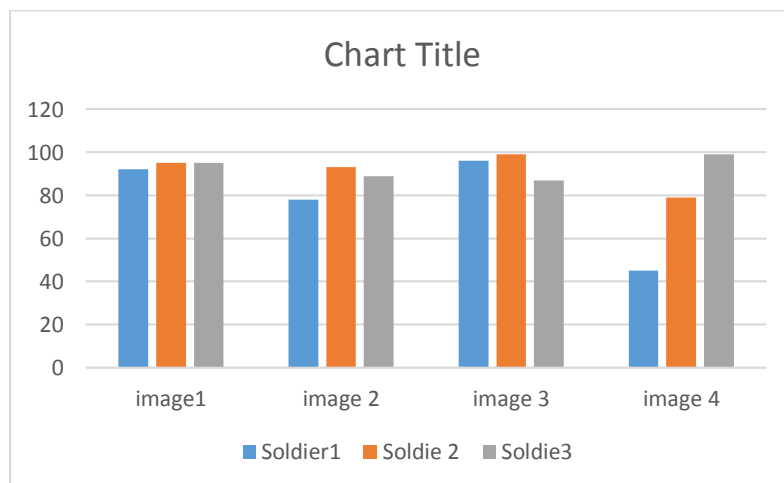## 3. RESULT ANALYSIS
We take different 4 images of each different 3 people. At different times these images got matched to a particular percentage. Sometimes one of the images of a soldier does not get a match with the image captured by the camera.

Efficiency:
- For first-person, the fourth image does not get matched total efficiency is77.75%.
- For second person all images get matched hence efficiency is 91.5%
- For the third person, all images are matched hence efficiency is 92.5%

So total efficiency=87.16%

Fig. 3: Chart for result analysis

4. FUTURE SCOPE

As per future implementation of the project, the high-resolution camera can be used. Also, a bomb detection system can be used for more security.

5. CONCLUSION

Terrorist attack security and soldier health monitoring system is developed to control attacks of terrorist on military base station with all-time area surveillance With information stored on IOT server this system will increase awareness about unauthorized entries in such areas. And if any person detected the system will notify particular authority about this issue with e-mail notification. Also with different sensors like heart bit, temperature and humidity sensor health of soldiers can be monitored.

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