



ADVANCED IOT EVM MONITORING SYSTEM USING RASPBERRY PI WITH FACE RECOGNITION

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Abstract: In India voting is one of the basic rights of each and every citizen. By using the privilege of vote individuals use to choose their reasonable pioneer who drives them. Already in India we utilized paper polls for voting process as this paper vote framework requires more labor and are along these lines less anchored. So further changes were made and electronic voting machines have come into picture in neighborhood, state and general areas. Considering these issues, extra highlights of this system are biometric security which can be acknowledged by using fingerprints and face acknowledgment of the voters. In this framework it is anything to confirm and check the particulars of an individual and it will deny on the off chance that somebody endeavors to make a second choice and we can likewise screen the people who are entering in the survey corner with the assistance of the webpage through the video reconnaissance. GSM module is utilized to make an impression on endorsed client that he has voted successfully. If any unauthenticated individual endeavors to vote the signal will be ON.

Keywords: Haar Cascade, Raspberry Pi3, Face Recognition System, Python, Finger Print module, Webcam, GSM Module.

I. INTRODUCTION

In creating nations the quantities of voters are expanding step by step. A debasement free voting framework is a consuming inquiry nowadays. These sorts of defilements can be ceased just through biometric voting framework. This task is intended for electronic voting machine by utilizing biometrics which

is utilized to recognize a person. In biometrics we have utilized unique mark sensor and face acknowledgment strategies where unique mark is utilized to catch thumb impressions of a specific individual and stores every layout in the unique mark module itself and face acknowledgment is an innovation which is equipped for recognizing or checking a man with the assistance of facial highlights. Haar course calculation is utilized for perceiving frontal highlights of face. GSM module is utilized to transmit a message to the endorsed client that he has voted effectively. Video reconnaissance is utilized for observing survey corner particularly with a specific end goal to counteract or identify a wrongdoing. These are frequently associated with an IP arrange and might be viewed by the controller. The procedure of this framework is done with the assistance of raspberry pi which is charge card measured camera. It can a significant number of the things that the pc likes playing amusements, spreadsheets and so on.

II. EXISTING METHOD

There are different projects presented for offering whole security for all habitations. Anyway there isn't any whole wellbeing found up and coming.

Bolt and Key process: First step toward assurance was Lock and Key framework. Inside the starting this method was demonstrated phenomenal however thereafter this procedure was once bombed as two or three keys will likewise be made serenely for a solitary bolt. Hoodlum may likewise make proliferation keys for the equivalent bolt. As

an outcome this strategy fizzled for offering whole security.

Secret key Authentication: Password as a verification strategy is the resulting phase of security process. The secret word is pre-put away inside the database. This secret key verification technique gives solid insurance to the clients. This strategy even have the inconvenience that secret key is successfully speculated.

Validation with the guide of RFID card: 1/3 level of security was confirmation by means of RFID card. This approach was adorned with periods of security. Access is allowed just for the individual whose RFID card matches with the database. Anyway the duplication of RFID cards is attainable so this approach was flopped later on.

III. PROPOSED METHOD

This paper proposes for policemen in recognizing the suspect as criminal or not. Face acknowledgment innovation is utilized to distinguish a man through an advanced picture. It's principally security reason. This method straightforwardly catches the picture data about shapes and sizes of face. The acknowledgment procedure done in Raspberry Pi by contrasting the information picture and computerized layout put away in a devoted database. The calculation is picked in Viola-Jones run and Face Detection exploitation Haar Cascades. A few calculations set up alternatives, face, and outward appearance confront demeanor by extricating highlights and historic points from the picture of subject's face. An administer investigations the relative position, size and type of the info looks for coordinating choices. Here, the site page is likewise included for fortune of data. The data of the suspect if perceived as criminal. The subtle elements of offenders effectively filled in the database. Along these lines, the outcome as in points of interest is shown on Webpage.

IV. HARDWARE SYSTEM

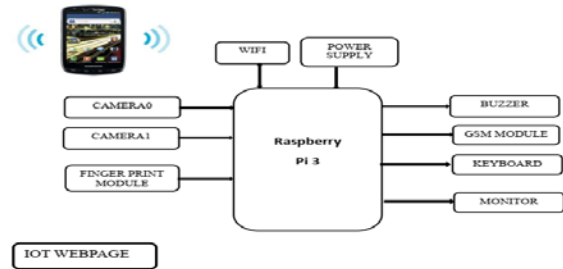


Fig: Block diagram

The unique mark we utilized is an optical scanner; the core of this scanner is a charged coupled contraption (CCD). The CCD has a variety of light tricky diodes, alluded to as picture locales. These photo sites create an electrical accordingly of light alarms. These cautions are spared in the kind of dull and lights pixels for edges and valleys individually inside the unique finger impression module, these darkish and lightweight pixels are utilized to separate between particular fingerprints. These checked pixels by and large composes and picture which is rearranged. A simple to-computerized converter is remunerate inside the scanner which changes over the simple electrical pointers to the advanced sort (inside the type of zero and 1 which is a paired outline). Sooner than contrasting the examined picture of unique finger impression with the prestored photograph, the scanner exams normal dimness phase of the pixels, it rejects if the checked photo is excessively darkish or excessively delicate.

Face Recognition System:

Face Recognition for Criminal Identification is a face affirmation structure in which the security ace will enter a photo of the individual being alluded to inside the system and the system will first preprocess the photo which will cause unwanted parts, for instance, upheaval to be removed from the photo. Starting there forward, the system will then request the photo in light of its breakthroughs for example, the partition between the eyes, the length of the jaw line, et cetera. By then, the structure will run an interest through the database to find its optimal match and demonstrate the yield. This work is focusing on completing the structure for criminal conspicuous verification. This structure included face database and a photo dealing with computation to facilitate the face feed with faces set away in the database. There are two areas basic to the achievement of this structure; disclosure and affirmation. Face recognizable

proof is a champion among the most basic walks in a face affirmation structure and can be orchestrated into four rule classes; data based, incorporate invariant, arrange planning and appearance-based systems. In affirmation, two stages are required; getting ready technique and appraisal process. In an arrangement technique, the estimation is supported cases of the pictures to be instructed and an indisputable model for each photo is settled while in an evaluation methodology, a model of an as of late picked up test picture is broke down against each and every current model in the database. By then the nearby relating model is acquired to choose if the affirmation is initiated. In this stage, an accurate framework, Principal Component Analysis (PCA) is used to on a social occasion of face pictures to shape a course of action of commence features, which is known as a game plan of Eigen faces. Any human face can be believed to be a blend of these standard countenances.

Face location utilizing HAAR Cascade Classifiers

The limit of this module is to choose where in a photo a face is found. The face acknowledgment module works by investigating a photo at different scales and looking for a couple of clear illustrations that demonstrate the proximity of an appear in the center and presented at a uniform size. Face distinguishing proof makes sense of where in a photo a face is found. The face distinguishing proof works by investigating a photo at particular scales and scanning for some straight forward outlines that perceive the proximity of a face. The customer need to login in the site page with his different affirmations which are secured in the server, to show his character. After viable login then a page with all the stack status is appeared, by then we need to enter the 10-digit convenient number which is kept in the GSM sim opening and press any load on key. Here the site page establishes a connection on the flexible number then the GSM scrutinizes that message and send it to the controller. The controller by then examines the code and on the specific load. To know the status we need to raise a request by crushing the request get on entering the flexible number, by then a message is sent to that compact number which is scrutinized by the controller through GSM module, after that the controller sends the

pile status and specific data regards to the cloud through the GSM module.

V.METHODOLOGY

Raspberry Pi: The Raspberry Pi 3 model B has specifically built with the Broadcom BCM2837 System-On-Chip (SoC) includes four high performance ARM Cortex-A53 process cores running at 1.2GHz with 32Kb Level one and 512Kb Level a pair of cache memory, a Video Core IV graphics processor, and is connected to a 1GB LPDDR2 memory module on the rear of the board. It additionally options 40-pins general purpose input-output (GPIO) and improved property with Bluetooth Low Energy (BLE) and BCM43143 Wi-Fi on board. It also has an upgraded power management source of 5V USB power supply up to 2.5 Amps. Currently, Raspberry Pi 3 Model B is best of Raspberry Pi computers. The system processing is huge with 1.2GHz clock speed and 1GB RAM Raspberry Pi can perform all advanced processes. According to the connection wise, the board should be capable of sending data to and from the board rapidly. A new dual band Wi-Fi supports for 2.4GHz and 5GHz 802.11b/g/n/ac which is also promises double throughout the 802.11b/g/n/ac Wi-Fi on the Raspberry Pi 3 Model B. With the addition of Gigabit Ethernet over USB 2.0, the wired Ethernet performance is also boosted, with an extreme throughput of about 300Mb.



Fig: Raspberry Pi 3 Model B

Fingerprint Sensor R-305: R305 is a fingerprint sensor module with TTL UART interface. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The finger print module can directly interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC.

Features:-

- Integrated image collecting and algorithm chip together, ALL-in-One
- Fingerprint reader can conduct secondary development, can be embedded into a variety of end products
- Low power consumption, low cost, small size, excellent performance
- Professional optical technology, precise module manufacturing techniques
- Good image processing capabilities, can successfully capture image up to resolution 500 dpi

**Fig 2: Fingerprint Sensor R-305**

Buzzer: The buzzer is a sounding device that can convert audio signals into sound signals.

... It is widely used in alarms, computers, printers and other electronic products as sound devices. It is mainly divided into piezoelectric buzzer and electromagnetic buzzer, represented by the letter "H" or "HA" in the circuit.

Webcam: "Webcam" alludes to the innovation by and large; the initial segment of the term ("web-") is frequently supplanted with a word depicting what can be seen with the camera, for example, a net cam or road cam. Webcams are video catching gadgets associated with PCs or PC systems, regularly utilizing USB or, on the off chance that they interface with systems, Ethernet or Wi-Fi. They are notable for low assembling costs and adaptable applications. Video catch is the way toward changing over a simple video flag, for example, that created by a camcorder or DVD player—to computerized frame. The subsequent advanced information are alluded to as a computerized video stream, or all the more regularly, essentially video stream. This is interestingly with screen throwing, in which already digitized

video is caught while shown on an advanced screen. Webcams regularly incorporate a focal point, a picture sensor, and some help hardware. Different focal points are accessible, the most widely recognized being a plastic focal point that can be tightened and out to set the camera's core interest. Settled center focal points, which have no arrangement for change, are additionally accessible. Picture sensors can be CMOS or CCD, the previous being overwhelming for minimal effort cameras, yet CCD cameras don't really beat CMOS-based cameras in the ease value go. Customer webcams are generally VGA goals with an edge rate of 30 outlines for each second. Higher goals, in uber pixels, are accessible and higher casing rates are beginning to show up.

**Figure 2.9 Webcam**

The video catch process includes a few handling steps. First the simple video flag is digitized by a simple to-advanced converter to deliver a crude, computerized information stream. On account of composite video, the luminance and chrominance are then isolated. Next, the chrominance is demodulated to deliver shading distinction video information. Now, the information might be altered to modify brilliance, difference, immersion and tone. Together, these means constituted video interpreting, since they "disentangle" a simple video configuration, for example, NTSC or PAL. Bolster hardware are available to peruse the picture from the sensor and transmit it to the host PC.

FEATURES:

- ✓ Smallest wireless video & audio camera
- ✓ Wireless transmission and reception
- ✓ High sensitivity
- ✓ Easy installation & operation
- ✓ Easy to conceit
- ✓ Light weight
- ✓ Low power consumption
- ✓ Small size

SPECIFICATIONS:

- Output frequency: 900MHZ 1200MHZ
- Output power: 50mW 200mW
- Power supply: DC +6~12v Distance covered: 10m

Monitor: A PC screen is a show connector that showcases data prepared by the PC's video card. At the point when a video card or illustrations card changes over parallel data from 0s into pictures, these pictures are shown onto the straightforwardly associated screen. There are diverse kinds of screens, including cathode beam tube (CRT) and fluid precious stone representations (LCD). Screens have shown works that incorporate fuelling it on and off, controlling shine, differentiation and position, among others. A fluid precious stone showcases or LCD is a sort of level board screen, which means it's intended to be thin. This component ought not to be mistaken for level screen, which means the PC's screen is level rather than bended. LCDs invigorate their screen uniquely in contrast to CRT screens. A LCD screen is made by electric voltages hitting fluid gem cells, permitting 64 distinct shades for every cell. LCDs have one determination measure, and, if a little determination is received, a dark fringe will show up around the re-sized determination.

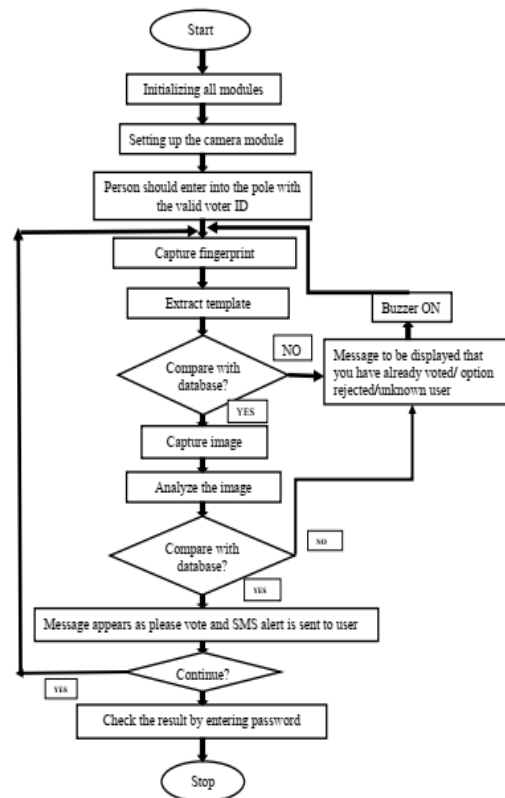
GSM Module SIM800: The GSM protect by methods for Microcontroller is utilized to send or get messages and make or get calls indistinguishable to a phone cellphone through influencing utilization of a SIM to card of any system supplier. We can do that with the guide of connecting the GSM guard to the given Microcontroller board and afterward connecting to a SIM card from any administrator that displays the GPRS protection approach. The shield utilizes utilizing a radio modem by the enterprise, SIM Comm. We can stay in contact promptly with the defend using the charges. The GSM library includes the different techniques for correspondence with the safeguard. This GSM Modem would then be able to work with any GSM people group administrator SIM card indistinguishable to a customary portable versatile with its own particular 10 digit unmistakable phone amount. The abilities of

utilizing modem is that its RS232 port can be utilized to interconnect and help a considerable amount of installed capacities.



Fig: GSM Module SIM800

FLOWCHART



VI. CONCLUSION

The endeavor "IOT BASED SMART EVM" has been satisfactorily masterminded and endeavored. Merging highlights of all equipment parcels are in this manner used and made it. Closeness of every single module has been

inspected out and put fastidiously. Along these lines we are adding it to the best working of the unit. In like manner, we are utilizing fundamentally actuated estimation with the assistance of various movements and the task has been figured it out.

FUTURE WORK

The splendid EVM can be used for races since it gives finish security and furthermore it will give the exact outcomes and it can spare time and consumption. The extra utility of this voting framework is a person with the correct access benefits can validate.

VII. RESULTS



Figure: Connection of the circuit TEST CASES OF RESULT

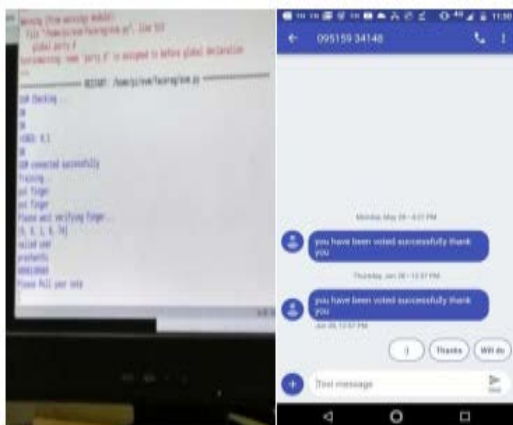


Fig: Output displayed on PC and message received by the user using GSM module

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