Face Recognition Based Electronic Voting Machine

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Abstract- The basic idea of this project is to create an EVM that will help to eradicate defrauding of a Manuel voting systems. And prior versions of electronics voting by raspberry pi. The proposed system uses to voter verification technique to give better results in comparison to Single identification based system. Facial recognition method is using for voter identification. We are using open CV based ML system for training and testing the faces. Image processing is more accurate than normal system we used currently for voting system. In this project we have two step verification first is normal verification that we are currently using and after that the machine will be only ready when the face is recognized. I.e. the machine will be ready only after the face is verified. This machine also contains the parts like buzzer andbuttons etc. as in normal EVM.

I. INTRODUCTION

Biometric is the science and technology of measuring and analyzing biological data. Biometric refers to the technologies that measure and analyze human body characteristics, such as DNA, fingerprint, eye retinas and irises, voice patterns, face recognition and hand measurements, for authentication purposes. The field of biometric was formed and has since expanded on to many types of physical identifications. Among this, face recognition remains a very common identifier and the biometric method of choice among law enforcement. These concepts of human identification have lead to the development of face recognition using web cameras that serves to quickly identify individuals and assign access privileges. The basic point of these devices in election commission. The face recognition, based authentication techniques can be very helpful to ascertain the identity of the people. We propose to integrate the face recognition based authentication techniques with the current system of voting process so thatthe device will help to eradicate defrauding of a Manuel voting systems. The proposed system uses to voter verification technique to give better results in comparison to Single identification based system.In this project we have two step verification first is the normal verification that we are currently using and the after

that the machine will be only ready when the face is recognized.

II. LITERATURE SURVEY

A.**Real Time Face Recognition based Electronic voting machine using Python GUI:** Electronic voting machine has already been ahead of and widely used in many developed countries. But most of them use face detection. In developing countries RFID for each person does not exist. And using RFID is still a priceless solution. Keeping up with these problems we have developed this project where PC will be used as host. This computer has the ability of image processing and control complete voting machine system. A camera will be used to take picture of citizen face recognition identify that this user is valid voter for that region. If the citizen is valid and then the person will be allowed to submit his/her vote. Each voting was stored in the text file format. At the end of the polling time that data will be handled by the authorized polling officer with the OTP method.

B.**Biometric Based Secured Remote Electronic Voting System:** India is world's largest democracy and the essence of any democracy lies in the fact that people choose their own representatives. But in present era, the fair election process is facing a lot of problems like booth capturing, rigging, fake voting, tampering with the Electronic Voting Machines (EVMs) etc. Being responsible engineers, it's our duty to do something to curb this menace. In the commonly used EVMs, the voting process takes place electronically and this eliminates the use of ballot paper to cast votes in elections as it is very time consuming and errors might crawl in intentionally or unintentionally. Today authenticity of the voter is a big concern and it also should be made sure that a same voter is not able to vote two times. This issue can be dealt with by introducing biometric based voting system, where the authenticity of a voter is established based on fingerprints. Hence, the principle shall be oneperson, one authentic vote. In the present work, a prototype fingerprint based biometric voting machine has been developed. It is proposed that a feature that will link the Aadhaar database of Unique Identification Authority of India (UIDAI), Govt. of India, New

Delhi; can be embedded. This shall facilitate all the voters to get registered on the portal automatically, which can be classified on the basis of regions and constituencies based on their unique identification i.e. their finger prints. This shall enable the device developed in the present research work, at the national level of application by using it in elections conducted around the country. This shall lead to a significant contribution for the betterment of the Indian election system.

C.**Multimode authentication based Electronic voting Kiosk using Raspberry Pi:** India being the fastest developing country and the largest democracy in the world has replaced the trivial paper based ballot system with EVMs in the voting process. The technical advancement in the field of voting process by introduction of electronic voting machines or EVMs has changed the way how voting is done all over the world along with the raise of security concerns and issues like hacking or tampering of EVMs. The Proposed paper discusses about the steps to mitigate the security issues and how the turn out in voting can be increased by introducing the voter to have the facility to vote from any constituency even if he belongs to some other constituency from the designate authorized voting centers. The voting process can be made more secure by involving finger print or bio metric based authentication in the design along with face and iris recognition features. The paper discusses how raspberry pi can be utilized to build the prototype.The face recognition, iris recognition along with finger print based authentication techniques can be very helpful to ascertain the identity [14] of the people. The project propose to integrate the face recognition and iris recognition features with finger print based authentication techniques with the current system of voting process so that the device will not only help for the intruder Identification but also it can be useful to track the cases which occur while voting such as fraud, forgery, tail gaiting in the event of voting and enhances the security inside the premises of voting or polling stations. The system is integrated with multi-layer security involvingthe face and iris recognition features with finger print authentication system. For enrolment process, the Voter needs to go to the authorized polling enrolment centers and at the polling booth has to register his biometric details such as face, iris and finger print with his constituency details. Once his enrolment is complete then he can cast his vote on polling dates from any of the authorized canters. The paper discusses how raspberry pi can be utilized to build the prototype.

III. WORKING

With the above simple idea in mind, for face recognition features to be implemented, we can prepare or train our own haar-cascade classifiers for face recognition and detect the same. By making use of Raspberry Pi 3, we can build the prototype. The haar cascade classifiers for face recognition have been trained on using open CV. The proposed system uses two voter verification techniques to give better results in comparison to Single identification based system.

In this project we have two step verification first is normal verification that weare currently using and the after that the machine will be only ready when the face is recognized. I.e. the machine will be ready only after the face is verified. This machine also contains the parts like buzzer and buttons etc. as in normal EVM. First the Electoral officer enables switch 1 then the LCD shows "hello welcome" and it shows" recognizing face" then only the Webcam starts to work. After the face is recognized it will compare with the previousvoting data and if the person is already voted the LCD displays "you had already voted ". A new person who has not yet voted comes forvoting then the kiosk will get enabled automatically for voting and in real time, vote is saved in the text file. Hence a Single person is not allowed to vote more than once, when he votes then in the database itself his ID will be marked as voted and hence duplicate and multiple voting is stopped. And if the person is not voted already the LCD will shows "you can vote now" then only the voter is allowed to enter the voting process.After person is recognized the switches S2, S3, S4 and S5 will enable and the after pressing it the data will be stored in a CSV file. After voting the LCD displays "you had voted and thank you". After the voting process the buzzer will make a beep sound.

The above process repeats number of time based on number of voters. Voting is deactivated until another person comes to vote. When each person votes for the particular political party then each time voting system will be updated in real time. The push buttons for new registrations, deletions, selection of voting process, an alarm buzzer, a 16x2 LCD for instructing Voter and revealing the election outcome are all controlled by the Raspberry pi.A camera records and stores photographic image in digital form. The web cam will be open in current capture Image, in addition to still images. Capture is usually accomplished by use of a photo in camera capture the images. It detecting the face detection and classification in cascade Classifier.

IV. CIRCUIT DIAGRAM

Circuit diagram of Electronic voting machine using raspberry pi is given in the Figure 1. Raspberry pi controls the whole process like reading the button, incrementing the vote count, generating result and display all the things on LCD. Here we have used Raspberry Pi 3 board to perform the all operations in the project and used wiringPi library for

selecting controlling the GPIO pins of Raspberry Pi. Here we have used five buttons, in which four have been used to vote for four different candidates and one button is used for showing the result on LCD. These five buttons are directly connected to GPIO pins, with respect to ground with 10k pull-up resistor eachone. A 16x2 LCD is connected with Raspberry Pi. And the data pins are connected to GPIO pins.

V. RELATED WORK

The work in this paper has been inspired by related papers mentioned, with the idea of smart and safer voting concepts. The Biometrically secured electronic voting machine explains about how the EVM can be integrated with the bio-metric. The paper referred stresses mostly on the aspects of security and safety. These ideas inspired and gave the idea of considering the Smart device using face authentication using the Raspberry Pi 3 for developing our
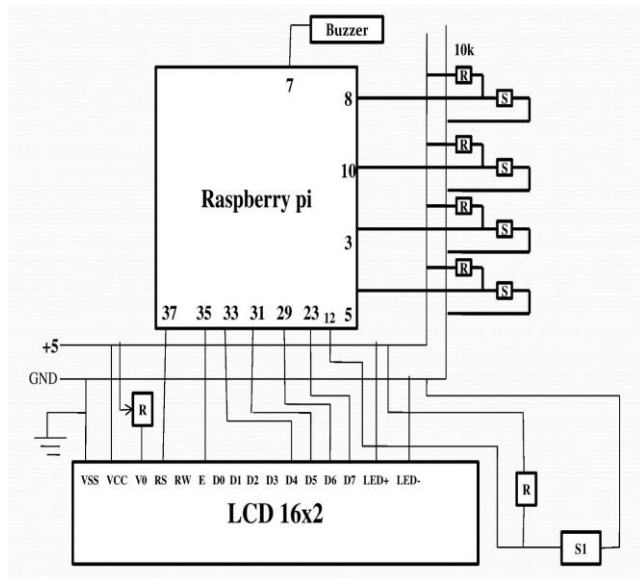

Fig 1: Circuit Diagram

device prototype for testing. In our implementation, we have used raspberry pi 3.The existing Smart kiosk for electronic voting has been designed based onthe principle of multi-layer security. The implementation of the bio-metric or finger print based electronic voting machine using Raspberry Pi 3 has been done successfully in the existing paper. Reading the data, processing it and verification of their formation stored is taken care well by Raspberry Pi.

In conclusion, the electronic voting kiosk implemented in the existing work can be used for voting and it willprovide portability, flexibility with low power consumption and will be very helpful for violence & rigging free voting purpose. Here they are implementing face and iris

recognition and alsofinger print recognition which will take more time than our project.

The earlier system that existed introduced a Biometric based secured remote electronic voting system, the system process is controlled Arduino microcontroller and it act an interface between the finger print sensors. Arduino has very limited memory and input output compared to raspberry pi. In present paper, a system has been devised which overcomes most of the problems faced in the existing voting system. This system will ensure o more secure voting process surely, which is required for the overall growth of a developing nation. The face recognition based voting system that has been proposed in this paper is faster and more efficient than the system reported in literature previously. Hence it is recommended that the proposed system means to be implemented at the national level for getting the major advantage of making electronic voting.

In the existing system Biometric Finger print devices and Web Camera are used in the Electronics Voting Machine for voter verification. That paper designed a Smart Voting Machine where there is no need for the user to carry his ID which contains his required details. The person at the polling booth needs only to place his Finger in finger print scanner and capture the face identity in web camera at the counter of the polling booth, thus allowing the acquisition of an on-spot Fingerprint and Face from the voter which serves as an identification. This data is passed on to the controlling unit forthe verification. The controller fetches the data from the reader and compares this data with the already existing data stored during the registration of the voters. If the data matches with the pre-stored information of the registered fingerprint and Face, the person is allowed to cast his vote. If not, a warning message is displayed on LCD and warns through the voice by this way, the person is barred from polling his vote. The vote casting mechanism is carried out manually using the keyboard. LCD is used to display the related messages, warnings and ensuing results. The main drawback of the existing system was Sensitivity of finger print module causessometimes Combine character error.

Fig 2: Existing System

VI. PROPOSED SYSTEM

The basic idea of this project is to create an EVM that will help to eradicate defrauding of a Manuel voting systems. And prior versions of electronics voting by raspberry pi. The Raspberry Pi is a series of single-board computers. They are low-cost, high-performance and the size of a credit card. The Raspberry Pi was developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi Foundation's goal is to "advance the education of adults and children, particularly in the field of computers, computer science and related subjects. "Many people have used Raspberry Pi is to make things like cameras, video game consoles, robots, web servers and media centers. Here we
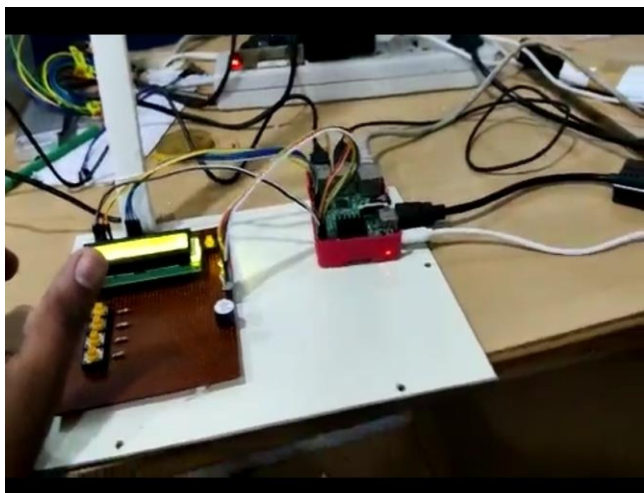

Fig 3: Proposed system

are using pi for the image processing (face reorganization.)The proposed system uses two voter verification techniques to give better results in comparison to Single identification based system.
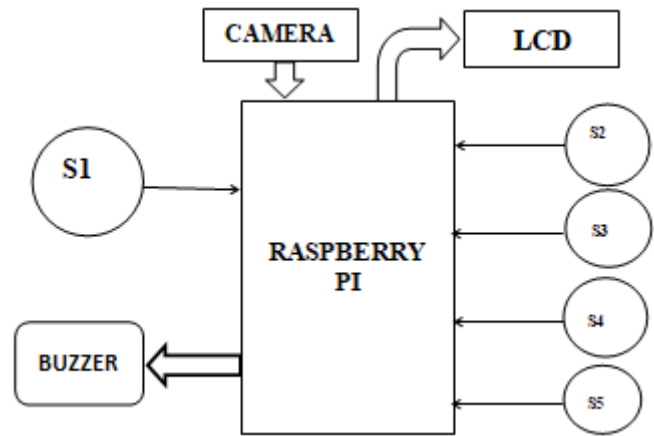

Fig 3: Block diagram of proposed system

Facial recognition method is using for voter identification. It is more accurate than normally used system. We are using open CV based ML system for training and testing the faces. Open CV is a cross-platform library using which we can develop real-time computer vision applications. Computer vision is a field of artificial intelligence that trains computers to interpret and understand the visual world. Using digital images from cameras and videos and deeplearning models, machines can accurately identify and classify objects — and then react to what they "see". Here we are using open CV. It mainly focuses on image processing, video capture and analysis including features like face detection and object detection. Image processing is more accurate than normal system we used currently for voting system. We had training programs, with that we can train faces of person. Although its prototype we can train right now. If we change it to a product government can provide the data. The cascades themselves are just a bunch of XML files that contain Open CV data used to detect objects. Since face detection is such a common case, Open CV comes with a number of built-in cascades for detecting everything from faces to eyes to hands to legs. There are even cascades for non-human things. In this project we have two step verification first is normal verification that we are currently using and the after that the machine will be only ready when the face is recognized. I.e. the machine will be ready only after the face is verified. Thismachine also contains the parts like buzzer and buttons etc. as in normal EVM.

VII. CONCLUSION

The project "FACE RECOGNITION BASED ELECTRONIC VOTING MACHINE" was mainly intended to develop face recognition based advanced Electronic Voting Machine (EVM) which helps in free and fair way of conducting elections which are basis for democratic country like India. The implementation of the bio-metric based electronic voting machine using Raspberry Pi 3 has been done

successfully. Design of the system has been ensured to meet all the specifications and requirements we had in our mind.

In the present paper, a system has been devised which overcomes most of the problems faced in the existing voting system. This system will ensure a more secure voting process surely, which is quite required for the overall growth of a developing nation. The face recognition based voting system that has been proposed in this paper is faster and more efficient than the systems reported in literature previously. Hence, it is recommended that the proposed system needs to be implemented at the national level, for getting the major advantage of making the e-voting system comprehensively full proof.The system can be manufactured simply as well as cheap and casting vote becomes easier by the process of voting from any place inside India

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