Biometric Electronic Voting Machine

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ABSTRACT

Main objective of this paper is to improve the existing Indian voting system. In the present voting system, one can easily poll the fake vote by various wrong methods. This may lead to a big democratic problem. By implementing some changes in the previous systems, we can make the polling process more secured and counting process fast and efficient. By using biometric in voting systems, the process of polling will be more secured than the existing system. In this system, no one can vote instead of the legit voter. All voter information is stored in this system. Here, we are using the fingerprint for the verification purpose. Every individual has a unique fingerprint. So, there will not be any kind of misconduct done while using this system. At the time of counting, the process can be done by connecting the system to the computer making the process faster.

KEYWORDS: EVM, Biometric, Finger Print, Arduino, Atmega 328, Voter, Database

1. INTRODUCTION

Fundamental right of voting in elections forms the basis for the democracy. Elections allow the people to choose their representatives and express their fondness for how they are governed. In all earlier elections of India, ballot paper was used for voting. This was time-consuming and very much susceptible to errors. The same method was continued till the electronic voting machines were presented in the election process. Because of the EVMs, all the materials like the ballot papers, ballot boxes and stamping are completely replaced into a simple box called ballot unit. EVMs hold all the characteristics of voting by ballot papers, while making polling a lot more convenient. Biometrics refers to approaches that describe human characteristics such as DNA, eye retinas, fingerprints and irises, voice patterns, facial patterns and hand measurements, for validation purposes. In our project we have used fingerprint for the purpose of voter identification or validation. As the finger impression of every individual is unique, it helps in decreasing the error. A database is created containing the fingerprint images of all the voters as mandatory. Illegal votes and replication of votes is checked for in this system with accurate coding. Hence, with the application of this fingerprint based EVM system elections could be made unbiased. Also the result can be stored in computer so that counting of votes will be more accurate and faster. Further that the elections would be no longer tedious and costly jobs.

2. METHODOLOGY

The objective is clearer due to the data and information has been collected from the previous literatures. The design model is the outcome of the hardware and software combination. The design model shows the prototypes, elements, architecture and components of the system. However in order to make this project successful the hardware and the software must be well integrated and structured.

Following are the main components of the project.

2.1. ARDUINO

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices. Arduino boards are available in preassembled form or as do-it-yourself (DIY) kits.

ARDUINO NANO

The Arduino Nano is a small, complete, and breadboard-friendly board and it is based on the ATmega328. It lacks a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is selected automatically to the highest voltage source.
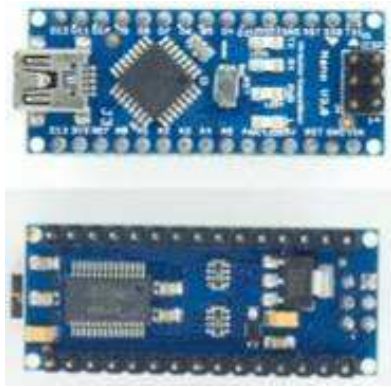
Fig 2.1 Arduino NANO

2.2. R307 FINGERPRINT MODULE

R307 Fingerprint Module consists of optical fingerprint sensor, high-performance fingerprint alignment algorithm, high-speed DSP processor, high-capacity FLASH chips and other hardware and software composition, simple structure, constant performance with image processing, fingerprint entry, fingerprint matching, search and template storage and other functions. It is small in size; no external DSP chip algorithm is used. It has low power consumption of the product as a whole, suitable for low-power requirements of the occasion. It is suitable for fingerprint lock, fingerprint safes and other purposes.

Fig. 2.2 R307 Fingerprint module

2.3. LCD

An LCD is an electronic display module which uses liquid crystal to produce a visible image. The 16×2 LCD display is a very basic module commonly used in DIYs and circuits. The 16×2 means it display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix.

Fig 2.3 LCD

2.4. BUZZER

A buzzer is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Fig 2.4 Buzzer

3. WORKING

Firstly database is created in the first MCU with the help of fingerprint module and a PC. At the time of polling, the voter has to put his/her fingerprint at the scanner. Then it is verified in the database. Now the second MCU will get activated and voter can enter their corresponding vote. If he/she is an invalid person, the machine becomes disabled and hence he can't vote. After voting a party all the polling buttons get disabled so that no repeated polling will be done. The party to whom the voter polled will be immediately updated in the database. Then the system will automatically reset and hence the next person can vote. As soon as a person polls, his/her id will be disabled and hence he/she can't poll again hence avoiding malpractices. After the completion of voting process, counting process can be easily performed by connecting the second MCU with PC and the result can be stored in PC in suitable file format such as excel file. This will help in the fast and accurate process for counting the vote hence reduced the possibility of fake voting and improper counting. Below figure shows the basic block diagram and prototype of our proposed system.
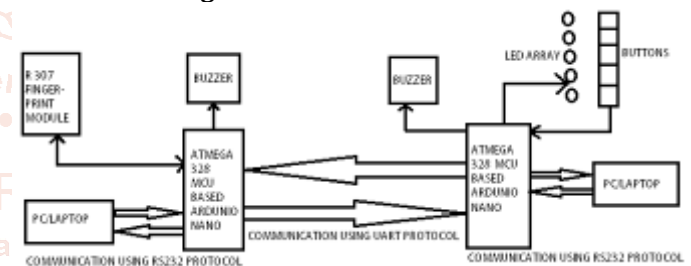
3.1. Block Diagram

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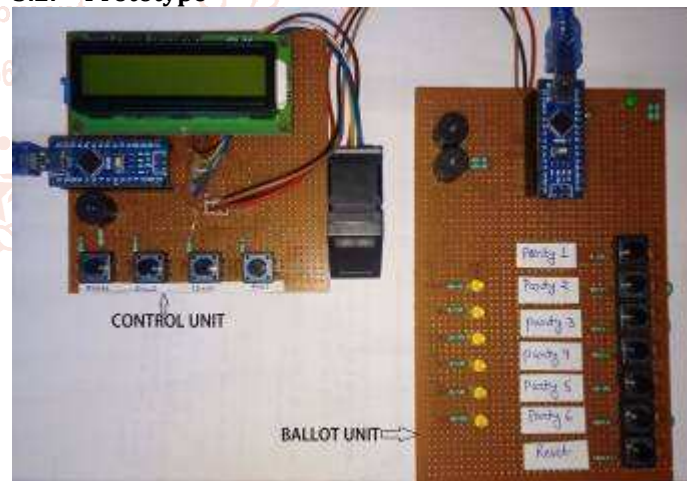
3.2. Prototype

Fig 3.2 Biometric EVM

4. RESULT

4.1. Enrollment/Deletion of ID

Enrollment is done by pressing enroll button on control unit. Database is prepared by using PC/ laptop. Similarly deletion is done by pressing delete button on control unit. Deletion is also done by using PC/ laptop.

Fig 4.1 Enrollment message as on machine

Fig 4.2 Delete message as on machine

Fig 4.3 Enrollment process on PC

Fig 4.4 Deletion process on PC

4.2. Voter Verification Ballot and Voting

To check the voter ID from the database, check button is to be pressed. When voter put his finger on the scanner, the fingerprint is checked in the database. If the voter is voting first time it will confirm the ID ballot unit will start. But if the voter tries to revote control unit shows the message REPEATED ID and the ballot unit will not start.

Fig 4.5 Voter Verification with Confirmed ID

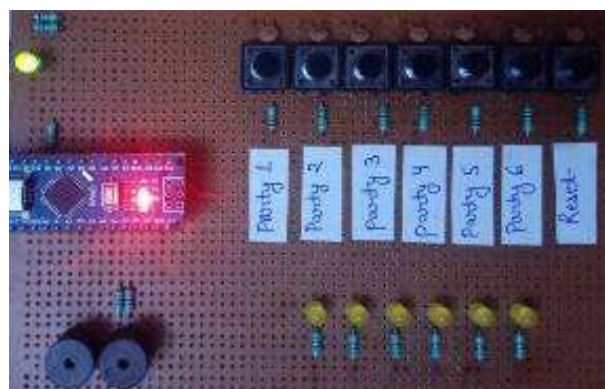**Fig 4.6 Voter Verification with Repeated ID**

Fig 4.7 Ballot unit to caste the vote

4.3. Result Declaration

After the completion of voting process, counting process can be easily performed by connecting the ballot unit to PC and the result can be stored in PC in suitable file format.
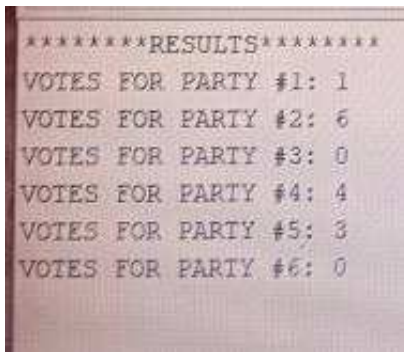
Fig 4.8 Result Declaration on PC

5. CONCLUSION

This Biometric Electronic Voting Machine is designed to make the procedure of voting easier and more convenient as it is a modified system. Fingerprint is one of the most popular biometric methods used for human recognition. Every individual in the globe is born with unique fingerprint even twins born with totally different fingerprints and fingerprint is naturally unchangeable throughout life. For that reason fingerprint voting system has been made and the person ID has been replaced with his fingerprint. Result can be stored on PC or server and counting can be performed accurately and fast. The proposed system has the benefit of using a biometric authentication and controls the process of counting avoiding unnecessary things like ballot papers, manual counting, etc.

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