Fingerprint Based Voting System

1st Tashildar Prasad, 2nd Chougule Nikhil, 3rd Chougule Sukrut,4th Sharma Shubham,
Electronics telecommunication Department, Vishwakarma Institute of information TechonologyPune, Maharashtra, India.

sukrut.22120171@viit.ac.in , nikhil.22120173@viit.ac.in
prasad.22120210@viit.ac.in,shubham.22120292@viit.ac.in

Abstract-We are all familiar with the current electronic voting machines where the user has to press the voting button. But the machines were criticized from the start. This article explains how to build a biometric based voting machine using a fingerprint sensor R307 and Arduino Uno. In this system, a person has to register their fingerprints matchings to the system database which will be stored centrally in Arduino. Voters must put their finger on the fingerprint sensor, and if the finger matches the previously stored information, the voter can vote.
To determine the voters, the ID of the candidate will be initiliazed to store fingerprint so that the voter votes. It has simple equipment and is easy to access. It shortens the voting time, is easy to move from ballot boxes to ballot boxes, reduces the number of personnel in the ballot boxes, provides smooth, easy and accurate counting

Keywords— Biometric, voting system, Fingerprint, Arduino, identification

I. INTRODUCTION

Voting is the right of every citizen to vote and elect their leader. India is a democracy where every citizen has the right to vote and express his choice.People also have the right to change politicians by voting for candidates in the next election.Voting is not for electing politicians, but for schools, colleges, banks, communities etc to elect leaders. Biometrics is the science and technology of measuring and authenticating biological data. Biometrics refers to technological invention that measures and describe human characteristics such as DNA for personal authentication, identification, fingerprints, eye retinas and irises, vocal patterns, facial patterns and fingerprints.The field of biometrics has evolved and expanded to include various forms of physical identification.Among several types of human indentification fingerprints is still a very common and biometric selection method for police. This concept of identifying people has led to the development of fingerprint technology, which is used to quickly identify people and grant access rights. The main purpose of this device is to detect a person's fingerprint data and compare it with other fingerprint data. In our project we use fingerprint for voter verification or authentication. It helps reduce errors as each thumb is unique.The database is created in memory of arduino as to store the image containing the fingerprints of each voter. In this system, invalid votes and duplicate votes are controlled with appropriate coding.Therefore, elections can be held fairly and without manipulation using fingerprint EVM system. In addition, the selection will not be a difficult and costly task. The main purpose of this project is to create a system that requires the user to generate the fingerprint as proof of identity. The system reads the data from the fingerprint and identifies the data previously stored in file.If the content matches the stored data, the system prints voter authorization message. If the provided fingerprint information does not match, the system opens immediately to indicate that the security has been breached and department can continue to take action.

II LITERATURE SURVEY

Electronic Voting Machines were introduced in India in 1998 to replace traditional voting systems like the paper ballot system. Polling stations and monitoring stations are two divisions of voting machines used in India. This makes the voting system difficult to transport. This system is introduced by Bharat Electronic Limited. From 1998 until now, many upgradations in Electronic Voting Machine. 15 years is total life span of this system. On the recommendation of the selection committee, the manufacturer adopted the third generation design with additional changes. Today, voting machines are electronic devices that store votes electronically instead of voting papers.

- Ballot Paper Voting: In this voting system, paper slips are used for voting. Voting card is a simple piece of paper on which each voter writes the name of the candidate to vote for. A ballot paper and ballot box are used for this type of voting.
- VVPAT: The full form of VVPAT is “Paper Verification Path where Voters can be verified”. VVPAT is intended as a self-verification system for voting machines that allows voters to verify that their

vote is correct. This system is also used in conjunction with electronic voting machines for the 2019 elections in India.

- Electronic Voting Machines: Electronic voting is the traditional way of conducting elections using electronic voting machines. EVM's were introduced in Indian elections between 1998 and 2001. Before the introduction of electronic voting machines, a paper ballot system was used for elections in India. This paper voting system was widely criticized for fraudulent voting, so electronic voting machines were introduced.
- Remote Internet Voting: In this system, internet users can access the internet and vote from anywhere. It helps increase voter turnout accessibility and convenience.

In order to increase security we introduced fingerprint based voting system.In this voter can cast vote only after he/she has been authorized by system after matching of fingerprints otherwise they are not valid for voting.

III.HARDWARE AND SOFTWARE USED

1) FINGERPRINT SENSOR R307: Fingerprint Module consists of optical fingerprint sensor, high-speed Digitial signal processor ,high-performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

2).Arduino UNO:Arduino Uno board is a microcontoller based on the ATmega328P. It is programmable with the Arduino IDE through a type B USB cable. Arduino Software (IDE) consists of a serial screen which permits easy textual information to be despatched to and from the board. Analog pins of Arduino are connected to push buttons. Pin A0, A1, A2, A3 and A4 are connected to ENROLL, UP, DOWN, MATCH respectively. While digital pins D5, D4, D3 and D2 are interfaced with candidate 1 as CAN1, candidate 2 as CAN2, candidate 3 as CAN3 and RESULT respectively.RX and TX is connected to fingerprint module.

3). Push button: We have used Push button as the button to press it for performing specific functions. Push buttons are the type that work in a simple mechanism called Push-to-make. Initially it remains open or normally open but when pressed it allows current to flow or we can say it closes the circuit when pressed. Usually the body is made of some form of plastic or metal.

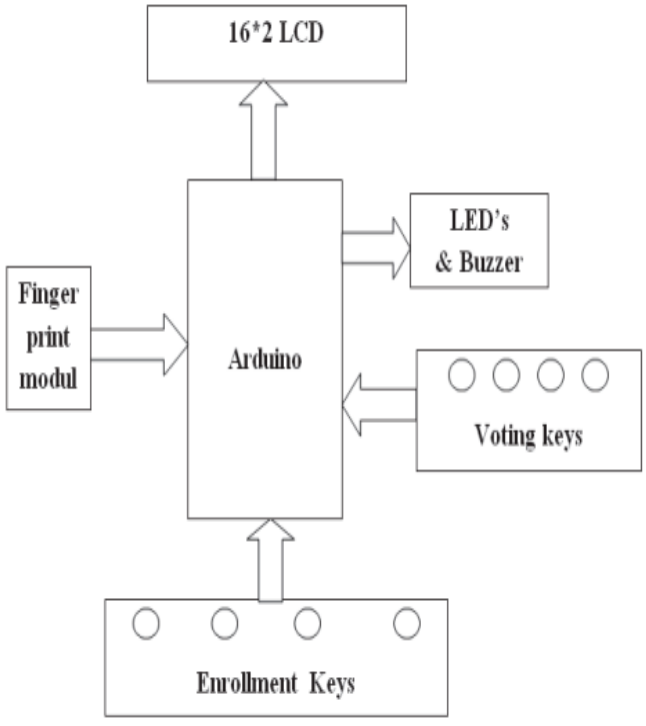
4). Buzzer: A device that sounds like a bell or a sound signal that can be mechanical, electromechanical, or piezoelectric (piezo for short). Common uses of buzzers and sounds include alarm devices, timers, and confirming user input such as mouse clicks or button presses.We used buzzer to beep after voting for confirmation.

5).16 * 2 LCD (Liquid Crystal Display): A type of flat panel that uses liquid crystal as its main function. LCDs have a large and varied use case for consumers and businesses, as they are commonly seen in smartphones, televisions, laptop video displays, and dashboards. LCD characters are suitable for displaying text, numbers and special characters. LCDs contain a small accessory circuit (case) mounted on the back of the LCD module. In this project, we used lcd to display messages like enrolling,matching,results,already voted to voter.

6).Arduino IDE: To interface fingerprint module with Arduino we have used Adafruit Fingerprint Sensor Library in Arduino IDE which is platform to code Arduino. The Arduino Integrated Development Environment (IDE) is a software to write a code and upload it on arduino,IDE contains a text box, a text field, a text editor, a buttoned toolbar, and various instructions for writing code. It connects to Arduino and Genuino hardware to upload programs and communicate with them.. Programs written using software (IDE) are called sketches. These sketches are written in the text and stored with the attached file. One.The editor has cut/paste and search/replace functions for text. Native messages provide feedback while saving and exporting, and also indicate errors. The console displays the output of the including all error messages and other information. The bottom corner of the window shows the card configuration and serial port. Toolbar buttons allow checking and loading programs, creating, opening and saving sketches, and opening the serial viewer.

IV.METHODOLOGY

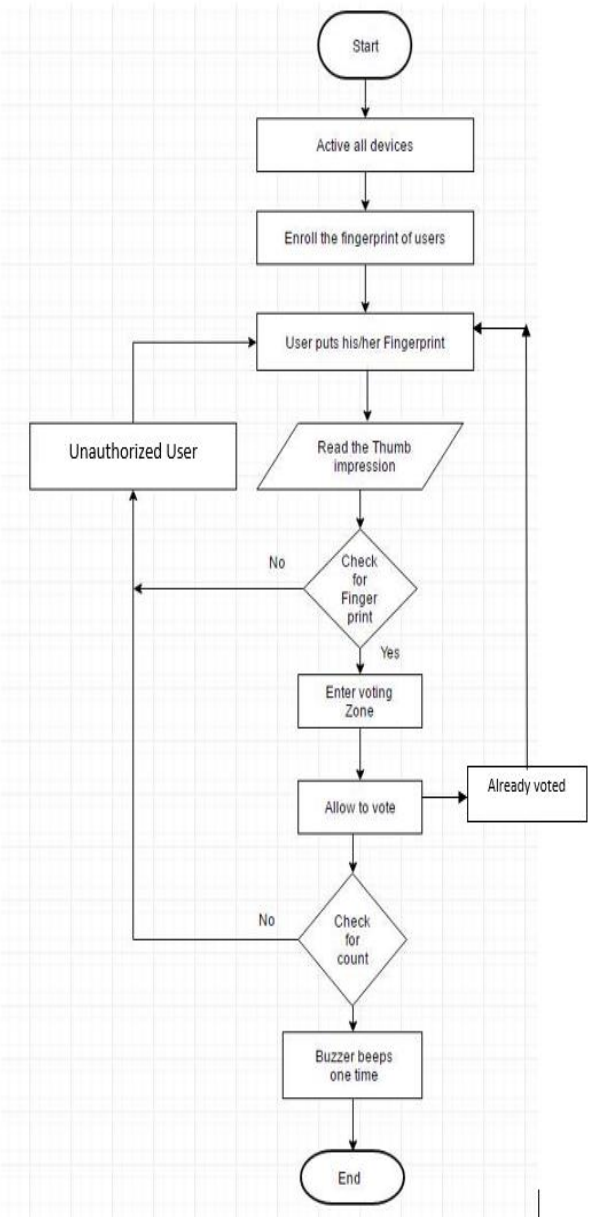
4.1 Working



Tools and equipment are used to develop the system. Since there is a variety of software and hardware available today, you should choose according to your needs. The system consists of a fingerprint sensor, an Arduino Uno microcontroller board, a power supply and an LCD screen. The biometric voting machine based on fingerprints is divided into two parts, in the first part the user must register and in the second part the user can vote for their desired candidate. The block diagram is shown above. All voters or users must be registered in the system with the help of a button or buttons.For this process, the user must press the ENROLL button, the LCD will ask for an ID and the fingerprint will be stored in a special memory in the arduino. For storing ID requires UP / DOWN keys. Click OK to select the ID. The fingerprint scanner will ask you to enter your fingerprint into the module. For a better experience, the LCD will ask the fingerprint module to remove the fingerprint and then insert the fingerprint again.

At the same time, it will take the fingerprint image and convert it to the appropriate format and store it in the memory of the fingerprint module and the selected ID. Once voters are registered in the system, they can vote for their candidates. Also, all users must be registered. All these points are intended for one system and the data in the system will be stored in the system itself without any interruption between the two systems.All machines are separate to prevent theft. In this system we have to make sure that the voters are enrolled first before voting day.So that it would be easy for voter to directly vote on voting day.

4.2 Flowchart:



V RESULTS

- Firstly voter has to enroll by clicking on enroll and placing finger.
- Voter has to select the id to store fingerprint in memory every voter has different id's.
- After enrolling voter has to press match key to compare fingerprint with stored one in memory.If fingerprint is matched then voter is granted for voting.Else it will display Unauthorized voter.

- After matching of fingerprint voter has palce to vote by pressing pushbutton in front specific candidate they want to vote.

- If voter has already voted then it display the message of “already voted”.So in this way fake voting can be prevented.

- After voting process is completed,results can be viewed by pressing on result button and winner will be declared.

VI BENEFITS AND ADVANTAGES

- Benefits Improved evaluation accuracy
- Results are determined .
- Authentication with biometrics improves securit y then current security EVM.
- Improve access to users.
- Fake voting can be prevented.
- Cost Effective
- Vote Time Mitigation

VII CONCLUSION AND FUTURE SCOPE

7.1 Conclusion:

Generally,this device overcomes many problems experienced by paper voting machines at some point during the voting period. This would actually create a more secure voting system, which could be just what developing countries need. In this paper, a fingerprint-based voting device is proposed that is superior and faster than the previous system. The new tool prevents illegal voter access, makes it easy to use, ensures transparency and protects the integrity of the vote. In addition, the device that prevents some votes through the same attribute and verify the right to vote. Fingerprint-based voting machine reduces the risk of invalid votes, shortens voting time, and is easy to transport from the ballot box to the polling station. Reduce the number of workers and work load. It offers accurate and precise counting. This voting method will help increase the number of votes.

7.2 Future scope:

Postal voting can be secured using IoT-based voting. The system allows voting from anywhere in the world. It will take less time for the system to get results than the current application. Controllers with more memory help store more data. Security can be improved by adding additional biometrics such as a face,iris etc.We can complete the system by improving online security.

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