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## Design of Biometric Electronic Voting Machine

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**Abstract:** *It has always been an arduous task for the election commission to conduct free and fair polls in our country, the largest democracy in the world. Crores of rupees have been spent on this to make sure that the elections are riot free. But, now-a-days it has become common for some forces to indulge in rigging which may eventually lead to a result contrary to the actual verdict given by the people. This paper aims to present a new voting system employing biometrics in order to avoid rigging and to enhance the accuracy and speed of the process. The system uses thumb impression for voter identification as we know that the thumb impression of every human being has a unique pattern. Thus it would have an edge over the present day voting systems. As a pre-poll procedure, a database consisting of the thumb impressions of all the eligible voters in a constituency is created. During elections, the thumb impression of a voter is entered as input to the system. This is then compared with the available records in the database. If the particular pattern matches with anyone in the available record, access to cast a vote is granted. But in case the pattern doesn't match with the records of the database or in case of repetition, access to cast a vote is denied or the vote gets rejected. All the voting machines are connected in a network, through which data transfer takes place to the main host. The result is instantaneous and counting is done finally at the main host itself. The overall cost for conducting elections gets reduced and so does the maintenance cost of the systems.*

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**Keywords:** *Fingerprint Reader, Arduino, Liquid Crystal Display (LCD).*

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### 1. INTRODUCTION

The objective of voting is to allow voters to exercise their right to express their choices regarding specific issues. Technology is being used more and more as a tool to assist voters to cast their votes. The two types systems implemented for voting are: Ballot Box, EVM. Knowing the disadvantages in the previous methods the biometric method of voting is being implemented. In the biometric process we are utilizing the fingerprint authentication of the individual. Electronic Voting Machine (EVM) is a simple electronic device used to record votes in place of ballot papers and boxes which were used earlier in conventional voting system. Fundamental right to vote or simply voting in elections forms the basis of democracy. All earlier elections be it state elections or centre elections a voter used to cast his/her favourite candidate by putting the stamp against his/her name and then folding the ballot paper as per a prescribed method before putting it in the Ballot Box. This is a long, time-consuming process and very much prone to errors. This situation continued till election scene was completely changed by electronic voting machine. No more ballot paper, ballot boxes, stamping, etc. all this condensed into a simple box called ballot unit of the electronic voting machine. Because biometric identifiers cannot be easily misplaced, forged, or shared, they are considered more reliable for person recognition than traditional token or knowledge based methods. The basic point of this system is to examine the fingerprint image of an individual and compare it to a database of the registered fingerprints. They provide a quick, easy, efficient, and secure measure through which, an individual with the exact authentication can only cast the vote.



Fig.1 A Typical EVM

Biometric voting has made the voting procedure simpler. It is a revolutionary method preferred to traditional EVM voting, as it is risk defective. It is advantageous because it includes features such as avoidance of invalid votes (booth capturing), reduction of counting time and the expenditure incurred on manpower deployment and carrying of photo ID cards for voters for recognition. In our project we are using micro-controller to build a biometric EVM easily and simple to operate. A polling officer controls the voting process. She/he grants permission to the voters to vote their selected candidate if the fingerprint is recognized. Each person can vote for one candidate only. In our project we have allotted 9 keys for 9 candidates each. A candidate can be voted for a maximum of 10000 votes. When a vote is voted a beep sound is indicated by a buzzer. Finally results are being displayed on the LCD, when polling officer enters the password.

## 2. COMPONENTS

Controller (Atmega16), Finger print scanner module, LCD, Power supply unit, Switches, Miscellaneous components.



Fig.2 Fingerprint module

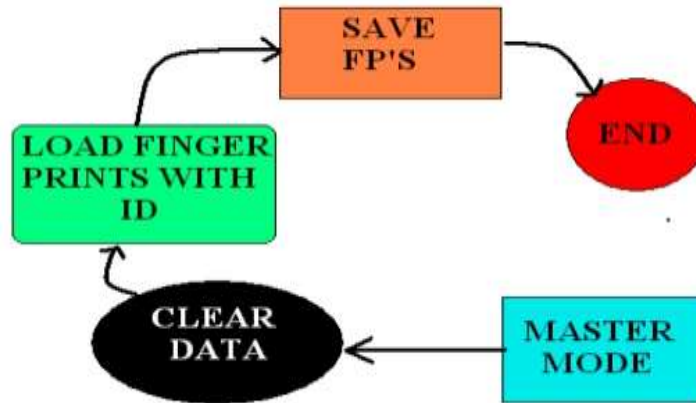
The techniques used here are: 1. Extraction algorithm 2. Matching algorithm. Extraction algorithm involves: Image enhancement, Image Analysis, Ridge reconstruction & Minutiae extraction. A template of this image is created for every fingerprint image stored in the memory. The matching algorithm finds out whether there is a match by comparing two templates extracted by the characteristic point extraction algorithm, specifically by comparing the positions of each characteristic point and the structure.

The LCD display is used to display the messages during the action. Here a 16x2 display is used. Displays have built in backlight (blue or green diodes).

### 3. METHODOLOGY

The fingerprint scanner used here is R-305. The methodology involves of storing the fingerprint images as database and during voting the input image is matched using the database.

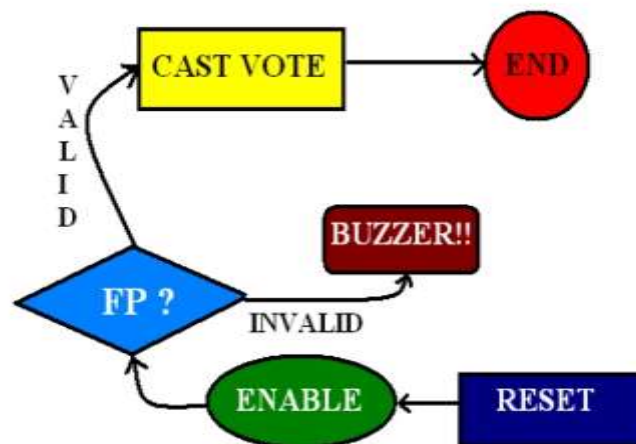
#### PROCEDURE FOR REGISTRATION



#### 4. STEPS INVOLVED IN THE VOTING SYSTEM

- Authentication and voter identification.
- Voting and recording of votes cast.
- Vote counting and publication of election result

#### PROCEDURE FOR CASTING VOTE



#### ADVANTAGES

Rigging of votes can be avoided. It preserves voting secrecy due to fingerprint authentication. There is no scope of invalid and illegal votes. Also it is highly tamper proof. It facilitates quick and accurate counting, possible to declare results instantaneously.

#### CONCLUSION

This project can be used for voting since it overcomes all the drawbacks of ordinary voting machine also provides additional security. Its main advantage is that since fingerprint of every person is unique and hence this system completely reduces the chance of invalid votes. The system can be manufactured simply as well as cheap.

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