BIOMETRIC VOTING MACHINE USING ARDUINO

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Abstract: Electronic Voting Machine (EVM) is a very innovative system which enables in efficient voting operation. But the disadvantage of the existing EVM's is that there is no way to authorize the voter. Generally human body characteristic like DNA, fingerprints, voice patterns and hand measurements are used for authentication purpose. This information is stored, recorded and processed the above information as a digital information. In this project we are using fingerprint scanner for authentication purpose and the scanner is integrated with Arduino UNO and LCD display. Such system allows the concept of authorization and can check for eligibility and also avoid false votes. By doing this we can also reduce the polling time and can also increase the polling percentage.

Index Terms **- Arduino UNO, Fingerprint module, lcd.**

I. INTRODUCTION

We all are quite familiar with Electronic Voting Machines, where your vote gets registered electronically and you don't need to use ballot paper to vote in election. Today security is a major concern and it also needs to be ensured that someone can't vote twice, so this problem can be solved by introducing Finger Print Based Voting, where a person can be authorized based on his finger Print. This will also stops fake voting.

In this project a fingerprint module is used for enrolment and authentication purpose and it is connected with Arduino UNO. LCD display is used for interaction with voters and they need to act according to it. Switching keys are used at the time of enrolment and authentication. LEDs are used for better understanding with the system.

II. OBJECTIVE

The main objective of our project is to use fingerprint scanner for authentication purpose so that we can reduce fake votes and also reduce the polling time. The system stores the fingerprints of voters in the form of templates (binary string) in its memory. When the system identifies the voter it allows him to cast his/her vote. If the same person tried to vote again the system does not allow him to vote again as he has already casted his/her vote. Thus we can reduce fake voting and make the process transparent.

III. BLOCK DIAGRAM

The block diagram of the Biometric voting machine represents the components that are used and the connections which are made accordingly. The block diagram is depicted in the figure below. The below block diagram consists of the components like ultrasonic senor, DC motor, relay. The power supply is used to supply the necessary power to make the board function.

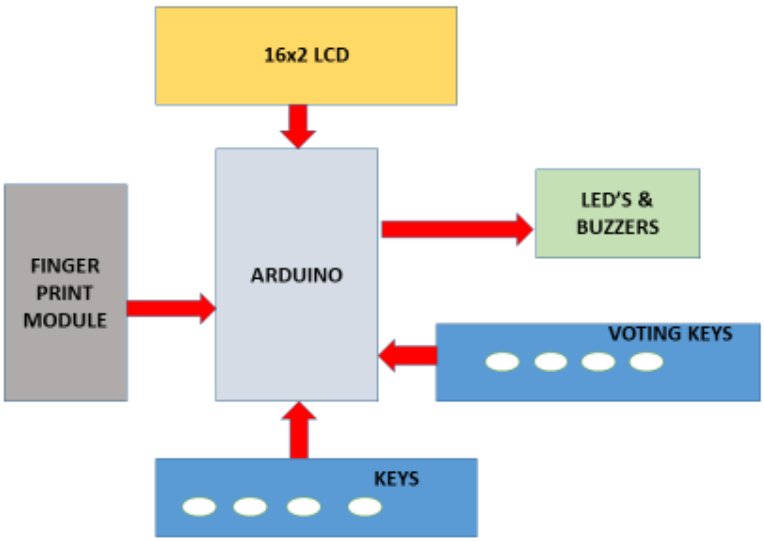

Figure 4.1: Block Diagram

3.1 FINGERPRINT SENSOR MODULE

Fingerprint scanners are security systems of biometrics. They are now used in police stations, security industries and most recently, on smartphones. Everyone has marks on their fingers. They cannot be removed or changed. These marks have a pattern and this pattern is called the fingerprint. Because there are countless combinations, fingerprints have become an ideal means of identification. In this project we are using R305 fingerprint module.

3.2 LCD

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters. One of the most common devices attached to an controller is an LCD display. Some of the most common LCDs connected to the controllers are 16X1.

3.3 SWITCHES

In electrical engineering, a switch is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. The most familiar form of switch is a manually operated electromechanical device with one or more sets of electrical contacts, which are connected to external circuits. Each set of contacts can be in one of two states: either "closed" meaning the contacts are touching and electricity can flow between them, or "open", meaning the contacts are separated and the switch is no conducting.

IV. ARDUINO UNO

Arduino board includes a microcontroller, and this microcontroller is what executes the instructions in your program. If you know this, you won't use the common nonsense phrase "Arduino is a microcontroller" ever again. The Arduino Uno is an open source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins, 6 analog I/O pins, and is programmable with the Arduino IDE, it can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts.

V.

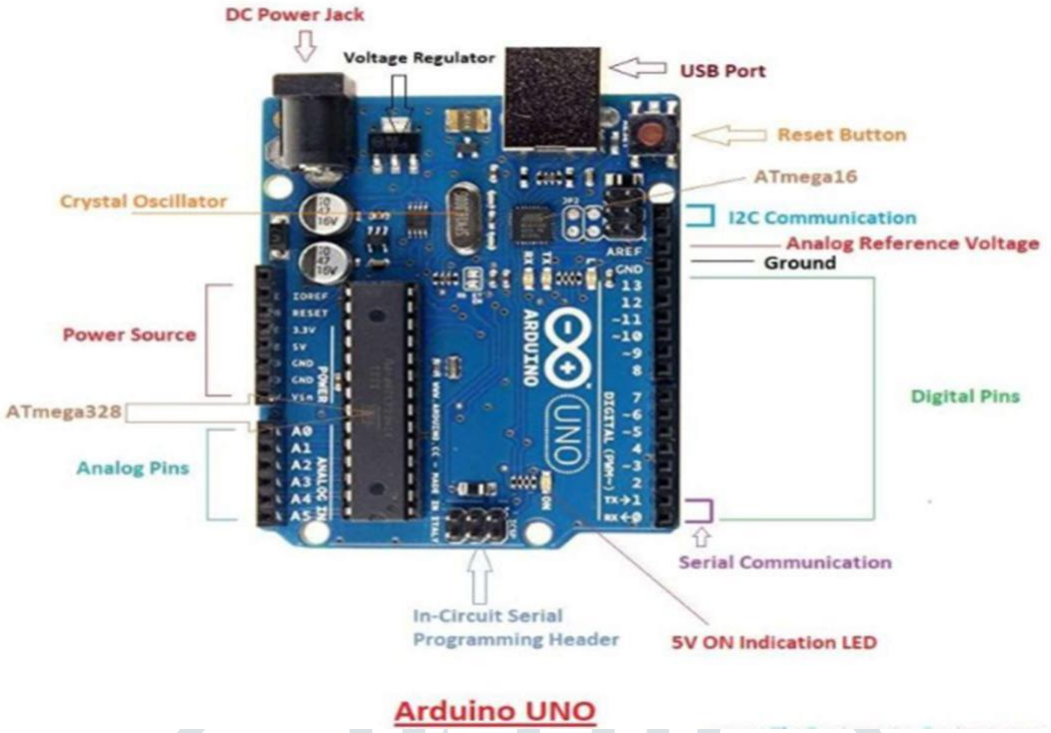

Figure 4.1 Arduino UNO Diagram

Since Arduino is Open Source, the CAD and PCB design is freely available. Everyone can buy a pre-assembled original Arduino board2 or a cloned board from another company. You can also build an Arduino for yourself or for selling. Although it is allowed to build and sell cloned Arduino boards, it's not allowed to use the name Arduino and the corresponding logo. Most boards are designed around the Atmel Atmega328.

V. METHODOLOGY

Working of this **Biometric Voting System Using Arduino** is a little bit complex for beginners. First of all, user needs to enroll finger of voters with the help of push buttons/keys. To do this user need to press ENROLL key and then LCD asks for entering location/ID where finger will be a store. So now user needs to enter ID (Location) by using UP/DOWN keys. After selecting Location/ID user needs to press an OK key (DEL key). Now LCD will ask for placing finger over the finger print module. Now user needs to put his finger over finger print module. Then LCD will ask to remove the finger from finger print module and again ask for placing the finger. Now user needs to put his finger again over finger print module. Now finger print module takes an image and converts it into templates and stores it by selected ID in to the finger print module's memory. Now voter will be registered and he/she can vote. By same method all the voter can be registered into the system. Now if the user wants to remove or delete any of stored ID then he/she need to press DEL key, after pressing DEL key, LCD will ask for select location means select ID that to be deleted. Now user needs to select ID and press OK key (same DEL key). Now LCD will let you know that finger has been deleted successfully.

The below figure shows the schematic representation of this project.

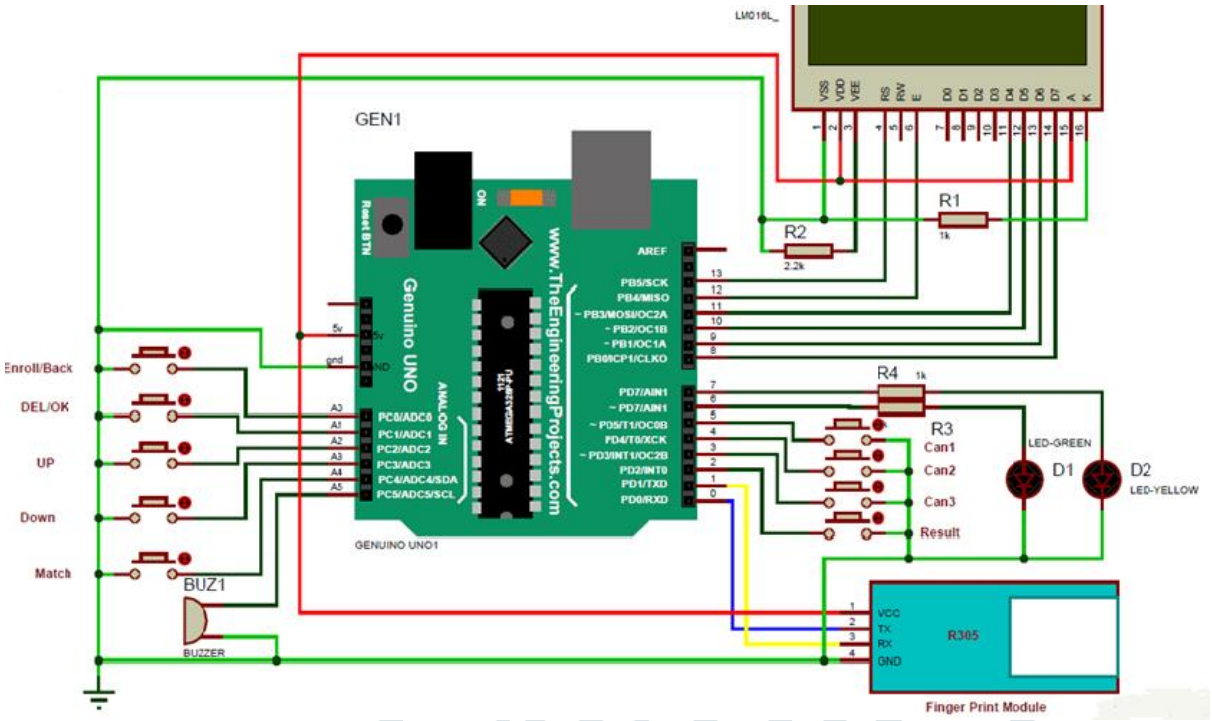

Figure 5.1: circuit diagram

VI. RESULT

Biometric voting machine using Arduino works effectively and saves a lot of time to declare results. It also eliminates fake votes thus making election process fair. The below figure shows that we can eliminate fake votes using this system.

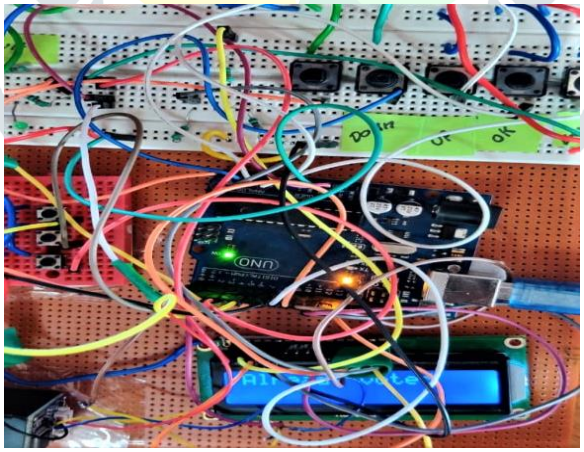

Figure 6.1 Elimination of fake votes

The below figure shows that the result obtained through this system is accurate in a very small amount of time.

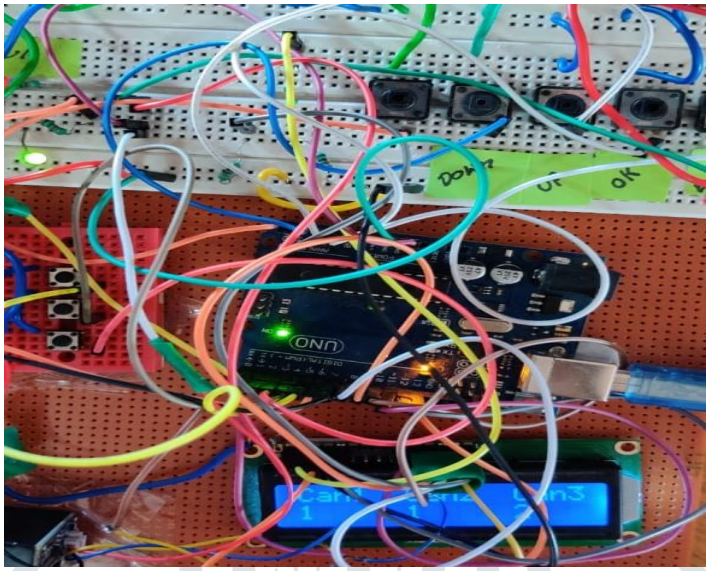

Figure 6.2 Accurate result

VII CONCLUSION & FUTURE SCOPE

Thus by using this project we can reduce chance of invalid votes, reduce polling time and provide easy and accurate counting without any mischief at counting Centre. By using this project, we can also reduce a lot of stationary and transport expenses so that we can save a lot of public money.

This system can be used for elections since it provides complete security and will save time and expenditure and this can be modified by interfacing it with pc through a serial port.

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