**ABSTRACT :**

This project focuses on voting system using RFID and Finger print technologies. Each user is provided a voter’s ID in the form of RFID Tag. The hardware design has a Finger print scanning sensor which is used to compare the finger print of the user with the pre-stored finger print of the user. During voting, both the finger prints are checked for matching and if it does not match, then an alert is given using buzzer. Keypad is used for selecting the voting preferences. LCD is used to display the corresponding data for each key to the user. Thus, illegal voting cannot be done since finger print is unique for each person. The voting process is carried out only if the finger print matches with the stored value.

**INTRODUCTION :**

Electronic voting (also known as E-voting) is voting using electronic systems to aid casting and counting votes. Electronic voting technology can include punched cards, optical scan voting systems and specialized voting kiosks (including self-contained direct-recording electronic voting systems, or DRE). It can also involve transmission of ballots and votes via telephones, private computer networks, or the Internet.

In general, two main types of E-voting can be identified

  e-voting which is physically supervised by representatives of governmental or independent electoral authorities (e.g.

electronic voting machines located at polling stations);

  remote E-voting where voting is performed within the voter's sole influence, and is not physically supervised by

representatives of governmental authorities (e.g. voting from one's personal computer, mobile phone, television via the

internet (also called I-voting).  
Electronic voting technology can speed the counting of ballots and can provide improved accessibility for disabled voters.

Electronic voting machine has now days become an effective tool for voting. It ensures flawless voting and thus has become more widespread. It ensures people about their vote being secured. It avoids any kind of malpractice and invalid votes. Also such kind of system becomes more economical as consequent expenditure incurred on manpower is saved. It is also convenient on the part of voter, as he has to just press one key whichever belongs to his candidates.

Voting machines use a two-piece system with a balloting unit presenting the voter with a button for each choice connected by a cable to an electronic ballot box.

An EVM consists of two units:

  Control Unit

  Balloting Unit

The two units are joined by a five-meter cable. The Control Unit is with the Presiding Officer or a Polling Officer and the Balloting Unit is placed inside the voting compartment. Instead of issuing a ballot paper, the Polling Officer in-charge of the Control Unit will press the Ballot Button. This will enable the voter to cast his vote by pressing the blue button on the Balloting Unit against the candidate and symbol of his choice. The controller used in EVMs has its operating program etched permanently in silicon at the time of manufacturing by the manufacturer. No one can change the program once the controller is manufactured.

The main drawback of this system is that, voter’s id checking process is manual hence possibilities of illegal voting by a wrong candidate. And also, possibility of multiple votes by same person.

Election and Voting is a routine part of our lives. In current voting system a person not in his constituency cannot vote. This paper removes this limitation by maintaining a centralized database of voters according to their consistency .A dynamic user interface provides list of candidates according to the constituency of voters. The voter can hence select candidate of his choice. The centralized database can also be updated online by having each polling station maintain their local database and update the centralized database after completion of election process. This paper also aims to provide RFID and biometric security. A RFID card will be provided to each voter. RFID card has a unique 12 byte code which can be read by RFID reader. A person can also use his fingerprint for unique identification. A five digit password will also be provided which again adds a level of security.

Keywords- Authentication, Biometric Recognition, Central database, hamming distance, RFID (radio frequency identification).

**EXISTING SYSTEM :**

Electronic voting (also known as e-voting) is [voting](https://en.wikipedia.org/wiki/Voting) that uses [electronic](https://en.wikipedia.org/wiki/Electronics) means to either aid or take care of casting and counting votes.

Depending on the particular implementation, e-voting may use standalone electronic [voting machines](https://en.wikipedia.org/wiki/Voting_machines) (also called EVM) or computers connected to the Internet. It may encompass a range of [Internet](https://en.wikipedia.org/wiki/Internet) services, from basic transmission of tabulated results to full-function online voting through common connectable household devices. The degree of [automation](https://en.wikipedia.org/wiki/Automation) may be limited to marking a paper ballot, or may be a comprehensive system of vote input, vote recording, data encryption and transmission to servers, and consolidation and tabulation of election results.

A worthy e-voting system must perform most of these tasks while complying with a set of standards established by regulatory bodies, and must also be capable to deal successfully with strong requirements associated with [security](https://en.wikipedia.org/wiki/Computer_security), [accuracy](https://en.wikipedia.org/wiki/Accuracy), integrity, swiftness, [privacy](https://en.wikipedia.org/wiki/Privacy), [auditability](https://en.wikipedia.org/wiki/Electronic_discovery), [accessibility](https://en.wikipedia.org/wiki/Accessibility), [cost-effectiveness](https://en.wikipedia.org/wiki/Cost-effectiveness_analysis), [scalability](https://en.wikipedia.org/wiki/Scalability) and [ecological](https://en.wikipedia.org/wiki/Ecology) sustainability.

Electronic voting technology can include [punched cards](https://en.wikipedia.org/wiki/Punched_card), [optical scan voting systems](https://en.wikipedia.org/wiki/Optical_scan_voting_system) and specialized voting kiosks (including self-contained [direct-recording electronic voting systems](https://en.wikipedia.org/wiki/Electronic_voting" \l "Direct-recording_electronic_(DRE)_voting_system), or DRE). It can also involve transmission of [ballots](https://en.wikipedia.org/wiki/Ballot) and votes via telephones, private [computer networks](https://en.wikipedia.org/wiki/Computer_network), or the [Internet](https://en.wikipedia.org/wiki/Internet).

**PROPOSED SYSTEM :**

We uses RFID (Radio Frequency Identification) and Finger print module R307 device to prevent direct entry of culprit who voting many time in ballot. So we provide this device with reduced man power and stored database . This device target to do verification process for voting. First RFID (Voter card) verified then fetch user data and display in Lcd screen we provided in this project, and then device want finger print verification to confirm the voter is matching to voter card(RFID) .If voter card and voter fingerprint matches then device allow to voting , else reject the person.

This system reduce time duration for man powered fetching database.

**ADVANTAGES :**

1. Man power Reduced.
2. Waiting time will be half of the existing system.
3. Cost effective.
4. Practical and affordable.
5. Ensure security, lower maintenance.
6. Prevent Fake vote or repeated vote.

**Working principle :**

Arduino UNO Send data to Lcd Display . LCD display shows “Welcome to Voting ” content with time delay of 2 seconds, then LCD print and ask for RFID card or voter ID card for first verification. RFID reader module read the voter ID or RFID data number and fetch for the user and lcd print the user name with Voter ID . Then LCD print “place your fingerprint ”, user have to place the fingerprint to the finger print scanner ,If finger print scanner data and RFID data matches user allowed to vote, this process indicate with LED bulb ( Blue ,Green).

**USES :**

* Reduce Manpower
* Automatic scanning process.
* Contactless communication.
* Low power consumption.
* Manpower salary reduced.
* Voting security level will not be breached.
* Fake vote prevented.

**Application :**

* Exam Center
* Election voting
* Institution
* Corporate Field
* Medicine testing lab.
* Government Sector.

**Conclusion**

We concluded this system reduce fake voting and repeated voting with less power consumption, and reduce manpower fetching database and cost for man power . In future digital India want this system to consume less time for waiting.

And this system everyone can easily handled so this device is User -Friendly.

**Arduino UNO :**

[Arduino](http://arduino.cc/) is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a [microcontroller](http://en.wikipedia.org/wiki/Microcontroller)) and a piece of [software](http://arduino.cc/en/Main/Software), or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board -- you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

### **Power (USB / Barrel Jack)**

Every Arduino board needs a way to be connected to a power source. The Arduino UNO can be powered from a USB cable coming from your computer or a wall power supply ([like this](https://www.sparkfun.com/products/8269)) that is terminated in a barrel jack. In the picture above the USB connection is labeled  and the barrel jack is labeled .

The USB connection is also how you will load code onto your Arduino board. More on how to program with Arduino can be found in our [Installing and Programming Arduino](https://learn.sparkfun.com/tutorials/installing-arduino-ide) tutorial.

****NOTE:**** Do NOT use a power supply greater than 20 Volts as you will overpower (and thereby destroy) your Arduino. The recommended voltage for most Arduino models is between 6 and 12 Volts.

### Pins (5V, 3.3V, GND, Analog, Digital, PWM, AREF)

The pins on your Arduino are the places where you connect wires to construct a circuit (probably in conjuction with a [breadboard](https://learn.sparkfun.com/tutorials/how-to-use-a-breadboard/) and some [wire](https://learn.sparkfun.com/tutorials/working-with-wire). They usually have black plastic ‘headers’ that allow you to just plug a wire right into the board. The Arduino has several different kinds of pins, each of which is labeled on the board and used for different functions.

* ****GND**** : Short for ‘Ground’. There are several GND pins on the Arduino, any of which can be used to ground your circuit.
* ****5V & 3.3V**** : As you might guess, the 5V pin supplies 5 volts of power, and the 3.3V pin supplies 3.3 volts of power. Most of the simple components used with the Arduino run happily off of 5 or 3.3 volts.
* ****Analog**** : The area of pins under the ‘Analog In’ label (A0 through A5 on the UNO) are Analog In pins. These pins can read the signal from an analog sensor (like a [temperature sensor](https://www.sparkfun.com/products/10988)) and convert it into a digital value that we can read.
* ****Digital**** : Across from the analog pins are the digital pins (0 through 13 on the UNO). These pins can be used for both digital input (like telling if a button is pushed) and digital output (like powering an LED).
* ****PWM**** : You may have noticed the tilde (~) next to some of the digital pins (3, 5, 6, 9, 10, and 11 on the UNO). These pins act as normal digital pins, but can also be used for something called Pulse-Width Modulation (PWM). We have [a tutorial on PWM](https://learn.sparkfun.com/tutorials/pulse-width-modulation), but for now, think of these pins as being able to simulate analog output (like fading an LED in and out).
* ****AREF****: Stands for Analog Reference. Most of the time you can leave this pin alone. It is sometimes used to set an external reference voltage (between 0 and 5 Volts) as the upper limit for the analog input pins.

### **Reset Button**

Just like the original Nintendo, the Arduino has a reset button .Pushing it will temporarily connect the reset pin to ground and restart any code that is loaded on the Arduino. This can be very useful if your code doesn’t repeat, but you want to test it multiple times. Unlike the original Nintendo however, blowing on the Arduino doesn't usually fix any problems.

### Power LED Indicator

Just beneath and to the right of the word “UNO” on your circuit board, there’s a tiny LED next to the word ‘ON’ . This LED should light up whenever you plug your Arduino into a power source. If this light doesn’t turn on, there’s a good chance something is wrong. Time to re-check your circuit!

### **TX RX LEDs**

TX is short for transmit, RX is short for receive. These markings appear quite a bit in electronics to indicate the pins responsible for [serial communication](https://learn.sparkfun.com/tutorials/serial-communication). In our case, there are two places on the Arduino UNO where TX and RX appear -- once by digital pins 0 and 1, and a second time next to the TX and RX indicator LEDs . These LEDs will give us some nice visual indications whenever our Arduino is receiving or transmitting data (like when we’re loading a new program onto the board).

### Main IC

The black thing with all the metal legs is an IC, or Integrated Circuit . Think of it as the brains of our Arduino. The main IC on the Arduino is slightly different from board type to board type, but is usually from the ATmega line of IC’s from the ATMEL company. This can be important, as you may need to know the IC type (along with your board type) before loading up a new program from the Arduino software. This information can usually be found in writing on the top side of the IC. If you want to know more about the difference between various IC's, reading the datasheets is often a good idea.

**RFID**

Radio-frequency identification (RFID) uses [electromagnetic fields](https://en.wikipedia.org/wiki/Electromagnetic_field) to automatically identify and track tags attached to objects. An RFID tag consists of a tiny radio transponder; a radio receiver and transmitter. When triggered by an electromagnetic interrogation pulse from a nearby RFID reader device, the tag transmits digital data, usually an identifying inventory number, back to the reader. This number can be used to track inventory goods.

There are two types of RFID tags:

Passive tags are powered by energy from the RFID reader's interrogating [radio waves](https://en.wikipedia.org/wiki/Radio_wave).

Active tags are powered by a battery and thus can be read at a greater range from the RFID reader; up to hundreds of meters. Unlike a [barcode](https://en.wikipedia.org/wiki/Barcode), the tag doesn't need to be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method of [automatic identification and data capture](https://en.wikipedia.org/wiki/Automatic_identification_and_data_capture) (AIDC).

RFID tags are used in many industries. For example, an RFID tag attached to an automobile during production can be used to track its progress through the assembly line; RFID-tagged pharmaceuticals can be tracked through warehouses; and [implanting RFID microchips](https://en.wikipedia.org/wiki/Microchip_implant_(animal)) in livestock and pets enables positive identification of animals.

Since RFID tags can be attached to cash, clothing, and possessions, or implanted in animals and people, the possibility of reading personally-linked information without consent has raised serious privacy concerns .

RFID tags are made out of three pieces: a micro chip (an [integrated circuit](https://en.wikipedia.org/wiki/Integrated_circuit) which stores and processes information and [modulates](https://en.wikipedia.org/wiki/Modulation) and [demodulates](https://en.wikipedia.org/wiki/Demodulation) [radio-frequency](https://en.wikipedia.org/wiki/Radio-frequency) (RF) signals), an [antenna](https://en.wikipedia.org/wiki/Antenna_(radio)) for receiving and transmitting the signal and a substrate. The tag information is stored in a non-volatile memory. The RFID tag includes either fixed or programmable logic for processing the transmission and sensor data, respectively.

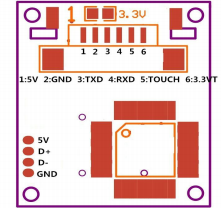
RFID tags can be either passive, active or battery-assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery-assisted passive has a small battery on board and is activated when in the presence of an RFID reader. A passive tag is cheaper and smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader. However, to operate a passive tag, it must be illuminated with a power level roughly a thousand times stronger than an active tag for signal transmission. That makes a difference in interference and in exposure to radiation.

Tags may either be read-only, having a factory-assigned serial number that is used as a key into a database, or may be read/write, where object-specific data can be written into the tag by the system user. Field programmable tags may be write-once, read-multiple; "blank" tags may be written with an electronic product code by the user.

The RFID tag receives the message and then responds with its identification and other information. This may be only a unique tag serial number, or may be product-related information such as a stock number, lot or batch number, production date, or other specific information. Since tags have individual serial numbers, the RFID system design can discriminate among several tags that might be within the range of the RFID reader and read them simultaneously.

**FINGERPRINT SCANNER :**

Fingerprint processing includes two parts: fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1:N).  
When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure.

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**Fingerprint Library**

System sets aside a certain space within Flash for fingerprint template storage, that’s fingerprint

library. Contents of the library remain at power off.

Capacity of the library changes with the capacity of Flash, system will recognize the latter

automatically. Fingerprint template’s storage in Flash is in sequential order. Assume the fingerprint

capacity N, then the serial number of template in library is 0, 1, 2, 3 … N. User can only access

library by template number.

**LCD DISPLAY I2C :**

I2C Module has a inbuilt PCF8574 I2C chip that converts I2C serial data to parallel data for the LCD display.

These modules are currently supplied with a default I2C address of either 0x27 or 0x3F. To determine which version you have check the black I2C adaptor board on the underside of the module. If there a 3 sets of pads labelled A0, A1, & A2 then the default address will be 0x3F. If there are no pads the default address will be 0x27.

The module has a contrast adjustment pot on the underside of the display. This may require adjusting for the screen to display text correctly.

Operating Voltage: 5V

Backlight and Contrast is adjusted by potentiometer

Serial I2C control of LCD display using PCF8574

Come with 2 IIC interface, which can be connected by Dupont Line or IIC dedicated cable

Compatible for 16x2 LCD

This is another great IIC/I2C/TWI/SPI Serial Interface

With this I2C interface module, you will be able to realize data display via only 2 wires.

**LIQUID CRYSTAL DISPLAY :**

A liquid-crystal display (LCD) is a [flat-panel display](https://en.wikipedia.org/wiki/Flat_panel_display) or other [electronically modulated optical device](https://en.wikipedia.org/wiki/Electro-optic_modulator) that uses the light-modulating properties of [liquid crystals](https://en.wikipedia.org/wiki/Liquid_crystal) combined with [polarizers](https://en.wikipedia.org/wiki/Polarizer). Liquid crystals do not emit light directly, instead using a [backlight](https://en.wikipedia.org/wiki/Backlight) or [reflector](https://en.wikipedia.org/wiki/Reflector_(photography)) to produce images in color or [monochrome](https://en.wikipedia.org/wiki/Monochrome).LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and [seven-segment displays](https://en.wikipedia.org/wiki/Seven-segment_display), as in a [digital clock](https://en.wikipedia.org/wiki/Digital_clock). They use the same basic technology, except that arbitrary images are made from a matrix of small [pixels](https://en.wikipedia.org/wiki/Pixel), while other displays have larger elements. LCDs can either be normally on (positive) or off (negative), depending on the polarizer arrangement. For example, a character positive LCD with a backlight will have black lettering on a background that is the color of the backlight, and a character negative LCD will have a black background with the letters being of the same color as the backlight. Optical filters are added to white on blue LCDs to give them their characteristic appearance.