

# Smart Online Voting System

Ganesh Prabhu S

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
s.ganeshprabhu @skct.edu.in

Prabu.S

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
17tuec144@skct.edu.in

R.R.Thirrunavukkarasu

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
thirrunavukkarasu.r.r @skct.edu.in

Nizarahammed.A

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
17tuec139@skct.edu.in

Raghul.S

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
17tuec156@skct.edu.in

P. Jayarajan

Department of Electronics and Communication  
Engineering  
Sri Krishna College of Technology  
Coimbatore, India.  
p.jayarajan@skct.edu.in

**Abstract**—Our country, India is the largest democratic country in the world. So it is essential to make sure that the governing body is elected through a fair election. India has only offline voting system which is not effective and upto the mark as it requires large man force and it also requires more time to process and publish the results. Therefore, to be made effective, the system needs a change, which overcomes these disadvantages. The new method does not force the person's physical appearance to vote, which makes the things easier. This paper focusses on a system where the user can vote remotely from anywhere using his/her computer or mobile phone and doesn't require the voter to go to the polling station through two step authentication of face recognition and OTP system. This project also allows the user to vote offline as well if he/she feels that is comfortable. The face scanning system is used to record the voters face prior to the election and is useful at the time of voting. The offline voting system is improvised with the help of RFID tags instead of voter id. This system also enables the user the citizens to see the results anytime which can avoid situations that pave way to vote tampering.

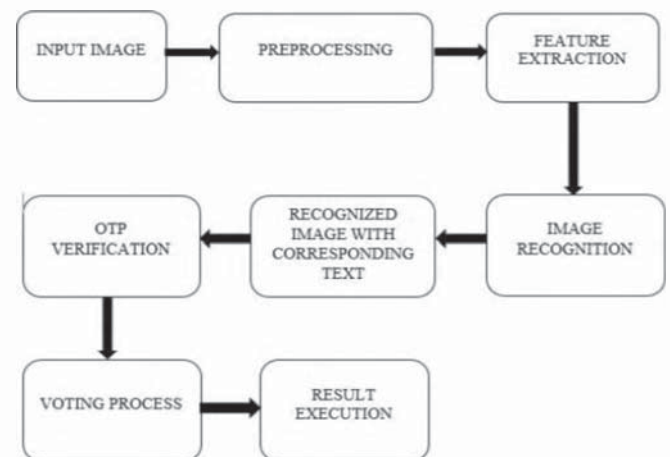
**Key Words:** Smart online voting system, Polling station, Face scanning, RFID, Results anytime.

## I. INTRODUCTION

Elections are inevitable happenings in a democratic society and it is the soul responsibility of both the government and the citizens to make sure that it happens in a safe and secure way and also it take place smoothly. By means of this system the person is required to record his face before the election and the same is taken to account to compare while voting. In offline the data recorded through offline is sent through the microcontroller to the Web after reading the details.

Application by means of serial terminal. The program for the web application manages the Individual Database. If a citizen casts his vote, the website sends a confirmation message as 'voted successfully' that the vote is successfully registered. In the process of voting, voicing their choices or articulating views. The main goal of this project is to make sure a voting system is designed using face recognition technology and OTP system to vote from any place on earth where internet is available. The Voting information is stored in the server database. As the world is changing day by day and is essential to adapt to the electronic world inorder to survive and meet world standards. This new technology refers to electronic voting systems where election is conducted online and offline but has a central database for smooth data transfers and result calculation. Therefore an e-voting system has to be designed and employed for a fair election to take place.

## II. ARCHITECTURE



### III. LITERATURE SURVEY

In the paper “SEVEP: Verifiable, secure and privacy preserving remote polling with untrusted computing devices” author “AMNA QURESHI”, describes, to design a polling system which is flexible in polling, using fingerprint devices to provide an extrastep of authentication, allow different devices which is available to the voter, no usage of polling sheets and to generate poll tags [1]. In the paper “Secure and Hassle Free EVM through deep learning face recognition” author “Ishani Mondal”, used neural networks after extracting the facial features of the voter and with that a reference to vote during election. If the details matches the existing details the user is allowed to vote [2]. In the paper “VOT-EL: Three Tier Secured State-Of-The-Art EVM Design Using Pragmatic Fingerprint Detection Annexed With NFC Enabled Voter -ID Card” author “Anooshmita Das”, proposed design, along with biometrics NFC technology is also taken into account [3]. In the paper “Secure and Electronic polling system”, the authors AMNA QURESHI, DAVID MEGÍAS, HELENA RIFÀ-POUS described Se-VEP, an e-polling system enabled by Internet which provides and protects the voter’s integrity, security, voters unique details, poll integrity, third party breaching, prevention of double voting, fairness in election, and coercion resistance, and preventing devices with virus which change the users decision in voting and giving false results which leads to lot of problems [4].

### V. EXISTING WORK

Currently, voting systems are Electronic Voting Machines (EVM) and Secret Ballot Voting which require man-power and are time-consuming processes. Individuals above age 18 are eligible to vote. Voter’s Id and others details are validated manually and only after confirmation he/she will be allowed to vote. The EVMs have to be checked and transported to different parts of the country wherever the election is taking place. It also needs manual power and security. The counting of the votes casted in EVMs also needs manpower and takes an entire day and ballot voting is entirely manual. So, there are a lot of ways the counting and the voting to not be clean. Hence the current system can be made a lot better, more accessible and more efficient.

### IV. METHODOLOGIES

**ARDUINO UNO:** This microcontroller is based on Atmega328p. It is an open source computing platform. It can operate on 3.3 volts and 5 volts. It has two external interrupts, three SPI pins for SPI communication, RX and TX to receive and transmit TTL serial data, 5 PWM pins to provide 8 bit PWM output and also two pins for TWI communication. It also has flash memory of 32 KB of which 0.5 KB used by bootloader. It has SRAM of 2 KB, EEPROM of 1 KB and clock speed of 16 MHz.

In our project, the Arduino is used as the main microcontroller for receiving the data from the RFID module and it also receives the face data using the mat lab and compares it with face of the user. If the data matches, then it allows the user to cast the vote.

**LCD DISPLAY:** A 16 \* 2 LCD is an alphanumeric display module which can display numbers and alphabets in 16 columns and two rows format that is 32 characters totally. It consumes 1mA power when the backlight is in off condition. A 5 \* 8 pixel box is used to build each character box. It has operating voltage 4.7 v to 5.3 v. It works on both 8 and 4 bit mode. It can have green and blue backlight. It has 8 data pins, VSS, VDD, contrast pin, register select, Read/Write pin, enable, 8 data pins and LED positive, negative pins. The LCDs are common replacement to cathode ray tubes in screen industries. It is less expensive, simply programmable and has less limitation to display custom characters. The life span of this device is generally less as the power supply is direct current but the power consumption is less and it is generally thin in size. The options for selecting automatic and manual mode of the meter is made available on this LCD Display. Once the RFID reads the data, the LCD will display the user data.

**RFID:** RFID short for radio frequency identification is a tracking system with the help of radio frequency technology. Barcodes are used to identify any information. Some RFID tags use electromagnetic energy transmitted from the RFID reader as power source while some use battery. The two types of RFID are battery operated and passive RFID tags. The three frequencies used by passive tags to transmit information are 125 – 134 KHz, 13.56 MHz and 865 to 960 MHz whereas the frequencies used by active RFID tags are 433 or 915 MHz. The RFID tags constantly send out signals. RFID tags contain a micro chip or integrated circuit, an antennae, a substrate or protective material layer to hold together every components. They are the best choice for supply chain management. Each RFID tag has a unique ID and some tags claim to have sequential IDs they are used to identify specific commodities. We can encode RFID tags with our desired data.

**PUSH BUTTON:** A push button typically stimulates a change in the circuit or produces an output when the button is physically pressed. It is made up of plastic or metal and flat surfaced to be easy to press. These kinds of switches are also called as momentary switches. Based on the usage the size of the buttons varies. For fire emergencies usually a red push button of moderate sizes are used. There are some industrial applications where when one push button is pressed the other pops out. To avoid the situations where the user presses the inappropriate button these buttons are color coded. Here four push buttons are used in the smart online voting system project each having a separate functionality. One is to select a party to vote, the second one is to deselect the party, the third one is to traverse through the list of parties and the final one is to confirm and cast vote to the selected party.

### V. WORKING

Our proposed online voting system allows the user to vote through either offline or online. If the user decide to vote through offline the user must have an RFID tag which will be issued by the government to him/her. It is scanned by a RFID card reader and then compared based on the details stored in the database.



Fig(2) Image Training Setup

The user if votes through offline must also undergo the traditional use cases of fingerprints and voter id.

If the user decides to vote through online the he/she must record their face in the system provided. The unique details of each user in their face along with the face image is captured multiple times and stored in the database given. Multiple instances are captured to ensure accuracy at the time of voting. Once the voter has registered their face in the system and has provided all their details he/she is ready to cast a vote. The voting process during the election is completely through the internet and is enabled only during the scheduled time of election. The user must possess a good internet connection and must possess a webcam for face recognition process for a smooth process. During the election time goes through two step authentication. The first is through facial recognition. When the user authenticates with his face through the webcam the system compares the given face with the images recorded in the database. When the user has already registered his/her vote and is a valid voter the user is proceeded to the next step of authentication. In the next step of authentication the user gets an OTP to his /her registered mobile number. The user is then prompted to enter that OTP in the system to cast a vote. Now if the OTP matches and all the credentials are right the user is ready to vote. The user can select a party and cast a vote. Thus the voting process is completed successfully. This system allows the whole family members to vote using one system or mobile phone setup as the process can be repeated n number of times since all requires is a mobile phone or a computer. Once the voting process is completed or even before the user has voted anyone can see the results of the ongoing election through website provided. The result publishing website is a central database which gets the data both from online website we are voting and from offline voters since the hardware setup sends the data to the database through a wifi module and is updated frequently thereby avoiding any mistakes to takes place. This greatly reduces the time taken to publish the results, counting the votes as it is completely handled by the machine in matter of seconds. Thus the system greatly avoids the chaos going at the time of election and will also reduce labor force, money and time.

## VI. CONCLUSION

The proposed method is to develop a secure internet voting system based on face recognition which tried to overcome all the drawback occurs in traditional or current voting system. The proposed system has many strong features like correctness, verifiability, convenience etc. For this system no requirement of an election officer, paper ballot or any electronic voting machine only the internet connection and Face scanners are required one can vote from anywhere secure.

## REFERENCES

- [1] AMNA Qureshi "SEVEP: Verifiable, secure and privacy preserving remote polling with untrusted computing devices," in *Future Network Systems and Security* Feb 22(2019)IEEE.
- [2] S.Ganesh Prabhu,Rachel, Agnes Shiny, and A. R. Roshinee. "Tracking Real Time Vehicle And Locking System Using Labview Applications." In *2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS)*, pp. 55-57. IEEE, 2020.
- [3] Annoshmitha Das "VOT-EL: Three Tier Secured StateOf-The-Art EVM Design Using Pragmatic Fingerprint Detection Annexed with NFC Enabled Voter -ID Card"(2016)IEEE
- [4] Ishani Mandal "Secure and Hassle Free EVM through deep learning face recognition".16th Feb(2019)IEEE
- [5] Shekhar Mishra and Y. Roja Peter - "Electronic Voting Machine using Biometric Finger Print with Aadhar Card Authentication" , *International Journal of Engg. Science and Computing* ,March 2018.
- [6] R. Maheswar and G. R. Kanagachidambaresan, *Sustainable development through Internet of Things , Wireless Networks*, 2020.
- [7] G.Kreethana and P.Priyanka – "Impressive Smart card Based Electronic Voting System", *International Journal of Research in Engineering and Technology*,March 2017
- [8] S. Malathy, Ravi Rastogi, R. Maheswar, G. R. Kanagachidambaresan, T. V. P. Sundararajan and D. Vigneswaran, A Novel Energy-Efficient Framework (NEEF) for the Wireless Body Sensor Network , *The Journal of Supercomputing*, Springer, 2019.
- [9] R. R. Thirrunavukkarasu, T. Meeradevi, A. Ravi, D. Ganesan and G. P. Vadivel, "Detection R Peak in Electrocardiogram Signal Using Daubechies Wavelet Transform and Shannon's Energy Envelope," *2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS)*, Coimbatore, India, 2019, pp. 1044-1048, doi: 10.1109/ICACCS.2019.8728556.
- [10] Ganesh Prabhu.S, K. Vinotha, M. Shanthala, S. Subhashini, S. Vishnu, "IOT Based Home Automation and Security System", *SSRG International Journal of Electronics and Communication Engineering (SSRG-IJECE)*, vol. 4, no. 3, pp. 19-22, 2017.