Aadhar Based Electronic Voting Machine

K.Indhumathi, P.Sudarsan, M.E.,**G.Nandhini, M.Shanmugapriya, M.Meena, G. Venkatesan**

Department of Electrical and Electronics Engineering,

Narasu's Sarathy Institute of Technology,

Salem, Tamilnadu, India,

Department of Electrical and Electronics Engineering,

Karpagam College of Engineering,

Coimbatore, India,

kk.indhu4@gmail.comsaradhanandu@gmail.com

Abstract

Our paper mainly focuses on avoiding the bogus that takes place in the voting system. Our system relies on embedded systems for day-to-day activities. Today every person in India is having an aadhar card. By using the database in the aadhar card in addition with the scanners the problem of bogus can be avoided. Firstly, the fingerprint of the voter is compared with the database for checking the eligibility of that particular voter. Then the QR code in the aadhar card is scanned as well. Our paper further proposes an innovative and inexpensive framework designed to check the repeatability of votes by the same voter.

Keywords: *PIC16F877A microcontroller, Fingerprint sensor, QR code scanner, Embedded C.*

1. Introduction

Elections are of utmost importance in any democratic country. Hence it is necessary to have a secured voting system. Since the ballot paper method is time consuming, electronic voting system was introduced. It is easy to transport, store and maintain. It also consumes very less time. However, the electronic voting machine has some problem like rigging. But this electronic voting machine can be made trustworthy, if we add some additional equipment to it.Today every people in India possesses aadhar card. So the government has all the data regarding the people. By using this database in addition with the scanners, the problem of bogus can be completely avoided. This system can also eliminate the fake voter and fake voter ID card.

2. Existing system

The existing system uses the electronic voting machine. It consists of two units namely the control unit and balloting unit. A cable of five meter connects the two units. The Presiding officer supervises the polling process while the Polling officer takes care of the control unit.The machine works on a program, and cannot be changed once the controller is manufactured. As the process is faster and reliable, it is less time consuming, economical, saves paper and man power.Actual process of identifying the voter has to be done by the Polling officer. And this system requires voter card. The Polling officer needs to verify the voter ID with the official list and then confirms the authorisation of the card and eligibility of voter. Hence this system requires manual verification of voter ID. Consequentlythis slows down the voting process.

3. Proposed system

We use aadhar card as a key factor.In this paper we are interfacing the electronic voting machine to a PIC16F877A microcontroller. The fingerprint and QR code of the voter is scanned and compared with the database.

4. Literature Survey

Before we set foot for real time implementation of our paper, we did a survey on the following papers.NamalaNaresh Kumar et al., (1),explained about finger print scanning and sending the results to the central counting station using GSM.Umang Shah et al., (2), explained about finger print matching using the data base in aadhar card. It also used a buzzer to indicate vote completion. DhineshKumar.M et al., (3), explained about verification of finger print of the voter. In this result is instantaneous and counting is done. The disabled persons can swipe their aadhar card in a swipe machine.Sudhakar.M et al., (4), Gives the best solution for minimizing the time taken for identifying the voter. It used KY-M6 fingerprint sensor along with a ARM9 microcontroller. It also checks the validity of the voter card. If the person has already voted it displays a message.

5. Block diagram of proposed system

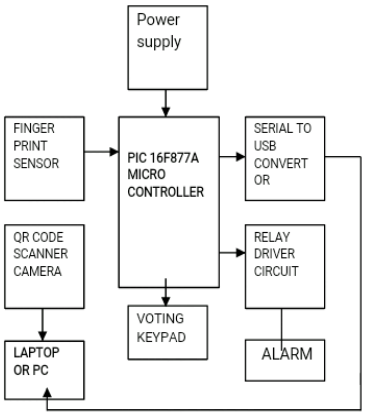

Fig 1 Block diagram of aadhar based Electronic Voting Machine

6. Components used

6.1 Power supply

Microcontroller,fingerprint sensor and serial to USB converter consume 5V each.Relay driver circuit alone consumes 12V. A transformer is used to step-down the AC voltage. The stepped AC voltage is converted into DC voltage using a bridge rectifier. An electrolytic capacitor is used as a filter to get a pure DC. Voltage regulators are used to obtain the required voltage.

6.2PIC16F877A Microcontroller

Fig 2 PIC16F877A microcontroller

It is self-programmable and can be write-erase as many times as possible**.**It has 40 pins, two8-bit and one 16-bit timer.It also has five Input / Output ports.It has only 35 simple instructions.It is economical. Embedded C language is used to program the microcontroller.

6.3 Fingerprint sensor

Fig 3 Fingerprint sensor

It is used for scanning the fingerprint of the voter.It compares the fingerprint of the voter with the stored database.This sensor is interfaced with the microcontroller. R305 is used as a fingerprint sensor.

6.4 Serial to USB converter

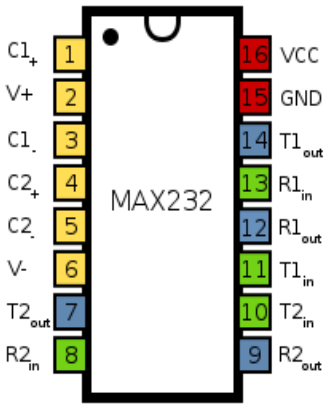

Fig 4 MAX232

It provides a serial communication between the microcontroller and laptop.It can either used as dual transmitter or dual receiver. It converts serial port signals to required signals. MAX232 is used for this purpose.

6.5 Buzzer

A buzzer is an audio signalling device, which may be mechanical, electromechanical or piezoelectric. The sound is created by inducing rapid movements in the diaphragm of the buzzer.The buzzer is driven by a relay. If a person tries to vote for more than once, buzzer goes on. The relay circuit is supplied with 12V DC.

6.6 QR code scanning camera

Fig 5 QR code scanning

These are small squares with black and white patterns. QR code encodes some sort of information. In this system, a camera is used to scan the QR code in the aadhar card.

6.7 Voting keypad

The voting keypad is connected to the PIC microcontroller.After the verification process, the voter is permitted to cast the vote using the voting keypad.Each party has a switch.The voter then presses the desired switch and the vote is stored in the control unit.

6.8 Embedded C

Embedded C is used to program the PIC16F877A microcontroller. It is a set of language extensions for the C programming language to address commonality issues that exist between C extensions for different embedded systems.

7. Working

A 230V AC Supply is stepped-down to 12V AC. It is then converted to 12V DC and 5V DC using a bridge rectifier and a voltage regulator. Firstly, the fingerprint of the appeared voter is compared with the stored fingerprint. If the fingerprint doesn’t matches, the voter is blocked from voting. If it matches then the QR code scanning camera opens. The QR code in aadhar card is scanned using a PC. If the QR code matches with the database, the voter is permitted to vote.

Otherwise the voter is blocked. Similarly, when a person tries to vote for more than once, the buzzer goes on.

8. Conclusion

This paper is used to enhance the security by eliminating bogus voting and vote repetition.The system can also be manufactured simply as well as cheap. If this framework is utilised then the elections would be truthful and free from rigging. By this framework the confidence and trust of the people will be increased.

References

1. Haralick, R.M., Shanmugam, K., Dinstein, I.H.: Textural features for image classification. IEEE Trans. Syst. Man Cybern. 3(6), 610–621 (1973). doi:10.1109/TSMC.1973.4309314
2. Cootes, T., Taylor, C.: Anatomical statistical models and their role in feature extraction. Br. J. Radiol. (2014). doi:10.1259/bjr/20343922
3. Dong, X.N., Wang, X.: Biomechanical properties and micro architecture parameters of trabecular bone are correlated with stochastic measures of 2D projection images. Bone 56(2), 327–336 (2013). doi:10.1016/j.bone.2013.05.023
4. Marcotte,D.: Fast variogram computation with FFT. Comput.Geosci. 22(10), 1175–1186 (1996). doi:10.1016/S0098-3004(96)00026-X