International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 10 | Oct - 2021 ISSN: 2582-3930

ADVANCED SECURE ELECTRONIC VOTING MACHINE USING DEEP LEARNING

[1]R.Hinduja, [2]P.Raja Pirian
[1]PG Scholar, M.E VLSI Design
[2]Assistant Professor, Department of ECE
Kings College of Engineering
Punalkulam, Tamilnadu
Affiliated to Anna University
Chennai, India

ABSTRACT:

Voting is one the fundamental rights of every citizens of a country. In India the voting system plays a major role during election. In past we had ballot paper method for voting which was time consuming and more storage space was needed. Later, Technology development bought Electronic Voting Machine in use. The EVM were designed by BEL and ECIL. The current EVM used in our country require more man power and less trustworthy. It doesn't have any verification step. In this project, the system concentrates on advance secure during election. The system provides verification step and more trustworthy. Before polling vote every citizen will be verified their fingerprint through deep learning method and then they will be identified by scanning QR code in their AADHAR card. After the verification steps over the voters will allow for polling vote. If the same voters trying to does polling vote again while the verification step the system will shows that he/she as already voted. This system will help to move a step ahead towards Digitalize India and Make in India.

KEYWORDS: Deep learning, CNN, Fingerprint recognition, QR code, AADHAR card, EVM, FPGA.

I.INTRODUCTION:

An EVM comprises of two units, a control unit, and the balloting unit. The two units are joined by a five-meter link. Balloting unit encourages casting a ballot by a citizen by means of marked catches while the control unit controls the polling form units, stores casting a ballot checks and shows the outcomes on 7 portion LED shows. The regulator utilized in EVMs has its working project carved for all time in silicon at the hour of assembling by the maker. Nobody (counting the maker) can change the program once the regulator is produced. The control unit is worked by one of the surveying stall officials, while the balloting unit is worked by the citizen in security. The official affirms the elector's recognizable proof at that point electronically initiates the voting form unit to acknowledge another vote. When the elector enters the vote, the balloting unit shows the vote to the citizen, records it in its memory. A "close" order gave from the control unit by the surveying corner official registers the vote, relocks the unit to forestall various votes. The interaction is rehashed when the following citizen with another elector ID shows up before the surveying corner official. The figure 1.1 shows the EVM

FIG 1.1 EVM

The two units have various carefully designed conventions. Their equipment, by configuration, must be modified once at the hour of their assembling and they can't be reconstructed. They don't have any remote correspondence segments inside, nor any web interface and related equipment. The balloting unit has an inner ongoing clock and a convention by which it records each info yield occasion with a timestamp at whatever point they are associated with a battery pack. The creators deliberately decided on battery power, to forestall the likelihood that the force links may be utilized to meddle with the dependable working of an EVM.

II. LITERATURE SURVEY:

In the year 2015, B. Madan Mohan Reddy and D. Srihari has proposed RFID based Biometric voting machine linked to Aadhar for safe and secure voting. In this system they used RFID tag to get voters details like their name, Aadhar number, ID number and so on. Then the voters authenticate their fingerprint through fingerprint module, and then they allowed for casting their vote. The drawbacks found in this paper are RFID card is not as accurate or reliable as barcode scanner. This tag can be misused and hacking. Tag collision can occur when numerous tags in the same area respond at the same time. It struggles to picking up information when the card gets wet. In the year 2017, Nadar Rajkani Paulraj, G.Rajagopalan, M.Rajesh, S.V.Kiruthika, and I.Jasmine A/P has proposed smart voting machine based on fingerprint and face recognition. The person at polling booth needs to verify their fingerprint through fingerprint scanner and their face through webcam. The fingerprint and face which captured from voters will compare with database which is predefined. If it's matched then the voters will allow for casting their vote. The drawbacks found in this system are face captured by using webcam is complex in real time and fingerprint module causes character error sometimes. In the year 2018, Mr.Kalash Srivastava, Prof. M.P.S Chawla has proposed Fingerprint based Electronic Voting Machine with Inbuilt Identification and Verification System. In this paper they did fingerprint verification by using minutiae matching algorithm method. The minutiae matching algorithm requires accurate minutiae extraction. There is a possible for false minutiae which leads to system unreliable. In the year 2019, Ishani Mondal, Sombuddha chatterjee has proposed Secure and hassle free EVM through deep learning based face recognition. In this paper they did face recognition using deep learning which complex task in real time verification.

III. EXISTING SYSTEM:

Facial recognition is a biometric solution that measures unique characteristics about ones face. Face recognition identifies people from the characteristics of photos and videos. So a face recognizer will identify the facial features and compare the values with those present inside the knowledgebase. Some sort of feature similarity metric aids in computational similarity matching and henceforth the most dominant label is attached as the label of the image. If the value of the similarity metric is lower than a particular value, the classification result will return false, i.e. the system will fail to recognize the person. This is how face recognition proceeds and if two persons are same, their feature similarity is too high. This system uses a deep CNN model for the purpose of feature extraction from the images. LFW dataset sample has been considered, and then finally the dataset has been customized with the images of the valid voters taken into the account of our experiment. The system captures the facial image of a voter through a deep CNN based face recognizer, verifies it with the pre-captured images in the database, the result being positive, assumes the voter is a valid one, asks him to cast his vote for a political party. After voting, the facial alignment of the voter gets deleted from the system, ensuring the voter to vote for only once. The dataset consists of 100 images of 10 people. Later, we have tested the system with the pre-captured images of the valid voters. The face detection, transformation and cropping has been done on the images. The face recognition based electronic voting system has been evaluated on a standard dataset and a custom dataset prepared for the purpose of testing real-time. The EVM was created by microcontroller 8051. By and large there are two units in Electronic Voting Machine. They are:

- Ballot unit
- Control unit

The ballot unit is likewise a fundamental part of EVM. It has the accompanying practical parts: Switches, Busy-Lamp, Ready-Lamp, Ballot paper. There are six switches on the voting form unit for six competitors. Each switch has a particular political decision mark before it for a particular competitor. These switches are accessible to the citizens to choose a competitor. When the EVM is controlled ON the Ready-Lamp turns on demonstrating that the EVM is prepared to acknowledge a vote. At the point when a vote is surveyed at the polling form unit, a sign is passed to the control unit through one of the six wires through which the polling form unit and the control unit are associated. Figure 3.1 shows Microcontroller based EVM.

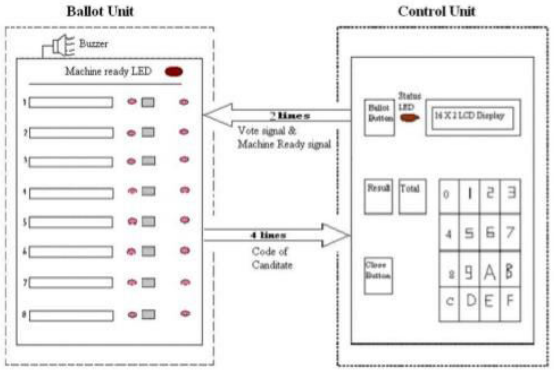


FIG 3.1 Microcontroller based EVM

The main and important part of EVM is control unit. The control unit keeps track of the input switches. When a vote is polled, the control unit increments the contents of the memory locations or registers reserved for the candidate polled for. After the voting is over the results of voting can be seen in LCD using a button, "RESULT", on control unit.

Limitations of existing methodology:

- Requires large number of human resources
- Face recognition is difficult in real-time
- Paper works will be higher
- Possibility of rigging
- Time consuming

IV.PROPOSED SYSTEM:

The proposed methodology overcomes the existing technology by developing the Deep learning based fingerprint recognition and FPGA based Electronic voting machine. In this method voters initially verify their fingerprint based on deep learning technology with CNN classifier and then they will identified by scanning QR code present in the AADHAR. The code in Aadhar contain the basic information about the voters, so the person verified by it. After verification process over the voters will allow for polling the vote. Once the voters polls the vote then SMS will be send to the particular voters mobile ensuring that they polled vote for specific candidate. If the same voters try to does polling vote again while the verification step itself the system will shows that the person is already voted. FPGA based Electronic voting machine will develop which is more suitable for real-time applications and can be reprogrammable and also more flexible than microcontroller. It also works fast and efficient than microcontroller based EVM.

BLOCK DIAGRAM FOR PROPOSED EVM:

The block diagram for proposed EVM is given in figure 4.1. It consists of Fingerprint authentication block along with Aadhar card verification block which requires QR code reader, Finger print scanner, Raspberry pi3 model B. The block diagram for authentication step is given as:

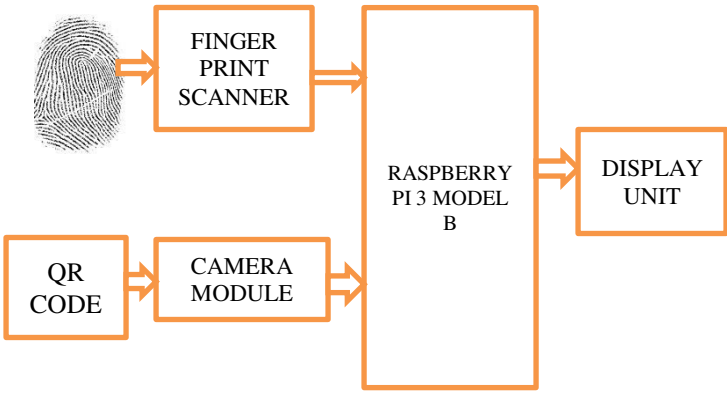
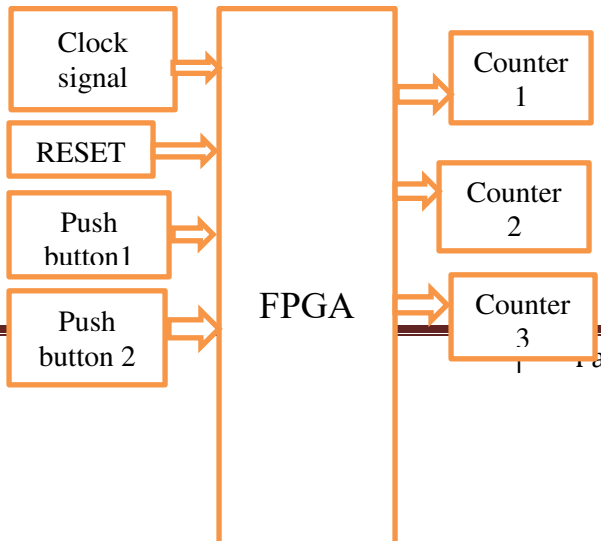


FIG 4.1 BLOCK DIAGRAM FOR AUTHENTICATION

The block diagram for Electronic Voting Machine is shown in figure 4.2 which is designed by using FPGA requires Push buttons for candidates, reset button, clock signal, counter, Buzzer button.



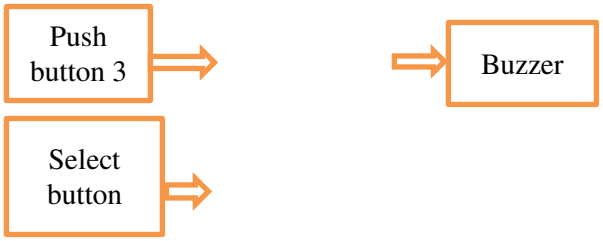


FIG 4.2 BLOCK DIAGRAM FOR VOTING MACHINE

HARDWARE REQUIRED:

1. Fingerprint module.
2. QR code reader.
3. Raspberry Pi 3 Model B.
4. Spartan3 FPGA.
5. PC

SOFTWARE REQUIRED:

. 1. LINUX OS
2. Tensor flow
3. MATLAB
4. Xilinx software

SIMULATION RESULT:

The simulation result for fingerprint authentication is given in figure

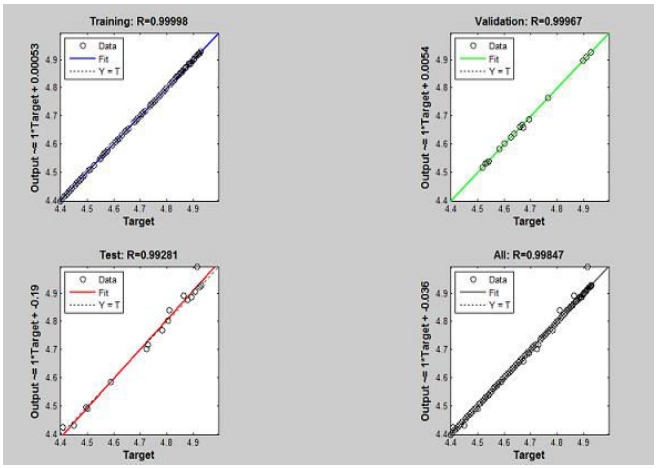


FIG X. Simulation for Fingerprint authentication

The RTL Schematic for proposed electronic voting machine is shown in figure

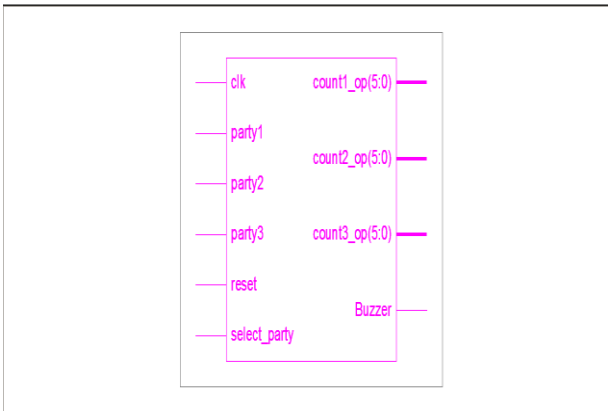


FIG Y. RTL Schematic for proposed EVM

The simulation result for proposed EVM is shown in below figure

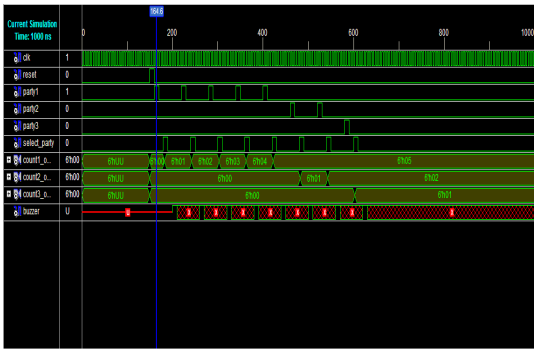


FIG XX. Simulation Result for proposed EVM

ADVANTAGES:

- Rigging will be eliminated completely.
- Finger print based authentication is more accurate by using deep learning.
- Preserves voting secrecy, No scope for invalid votes.
- Easier to manage with less demand on man-power.
- The deep learning architecture is flexible to be adapted to new problems in the future.

APPLICATIONS:

- Fast track voting which could be used in small scale elections, like resident welfare association, "panchayat" level elections and other society level elections.
- It could also be used to conduct 'opinion polls' during annual shareholders meeting.
- It could also be used to conduct 'general assembly elections' where number of candidates are less than or equal to eight in current situation.

CONCLUSION:

The proposed concept is more advantage than the traditional way of voting because it has lower risk of human and mechanical error. It provides security and privacy on high level with no compromise. This e-voting provides some authentication parameters like finger print using deep learning which provides high accuracy. This help to move a step ahead towards Digitalize India and Make In India.

REFERENCES:

1. Ishani Mondal , Sombuddha chatterjee(2019),'' Secure and hassle free EVM through deep learning based face recognition", International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (Com-IT-Con), India.
2. Mr.Kalash Srivastava, Prof. M.P.S Chawla(2018),'' Fingerprint based Electronic Voting Machine with Inbuilt Identification and Verification System", Journal of Advances in Electrical Devices Volume 3 Issue 3.
3. Nadar Rajkani Paulraj, G.Rajagopalan, M.Rajesh, S.V.Kiruthika, I.Jasmine A/P, (2017) , '' Smart voting machine based on fingerprint and face recognition", International Journal of Engineering Research & Technology (IJERT).
4. B. Madan Mohan Reddy, D. Srihari(2015),'' RFID Based Biometric Voting Machine Linked To Aadhar For Safe And Secure Voting", International Journal of Science, Engineering and Technology Research (IJSETR) Volume 4, Issue 4.