



# BIOMETRIC BASED MULTILEVEL SECURITY FOR VOTING MACHINE

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**Abstract**—*The Voting process is heart of democracy and India is largest democracy in the world where every citizen above 18 years has right to vote. For good democracy, a voting system should be correct, transparent and fully authentic. Biometrics technology is very advanced and more accurate in secure and feasible authentication to the voters . This electronic voting machine is more secured and better than exiting voting process. . In this paper we describe the design, construction and operation of a digital voting machine using a microcontroller profoundly.*

**Keywords** :*Biometric face recognition, LCD display, Fingerprint sensor.*

## I. INTRODUCTION

In India, voting is an important tool to collect and reflect people's opinions. So it must be more efficient, reliable, and secure. Elections in India are conducted almost exclusively using electronic voting machines developed by a pair of government-owned companies, the Electronics Corporation of India (ECIL) and Bharat Electronics Limited (BEL). India spends lot of money to improve their whole voting system to provide a better government to their citizens. Traditionally, voting is conducted in centralized or distributed places called voting booths. . In election a voter used ballot paper to cast his vote. This process is time consuming and very much prone to security, error and fraud. To overcome some of these issues, now a day paper based voting system was changed to electronic voting machine which is more secured. . Voting for any social issue is essential for modern democratic societies now a day. So it is becoming very important to make the voting process more easy and efficient. In other hand the rapid development in operating system of the mobile phones gives rise to the application development on the large scale. This paper presents voting system on android mobile with biometrics authentication.

## II.LITERATURE SURVEY

Hanady Hussien, Hussien Aboelnaga, IEEE 2013. "Design of secured E-voting systems." is able to desire with the widespread use of computers and embedded systems. Security is the essential problem should be considered in such systems. This paper proposes a new e-voting system that fulfils the security requirements of e-voting. It is based on homomorphic property and blind signature plan. The suggest system is executed on an embedded system which serves as a voting machine. The system employees RFID to store all conditions that comply with the rule of the government to check voter eligibility.

Urmila Shrawankar Dr. Vilas Thakare, "techniques for feature extraction in speech recognition system" The time domain waveform of a speech signal carries all of the auditory information. From the phonological point of view, very little can be said on the basis of the waveform itself. However, past research in mathematics, acoustics, and speech technology have provided many methods for converting data that can be considered as information if interpreted correctly. In order to find some statistically relevant information from incoming data, it is important to have mechanisms for reducing the information of each segment in the audio signal into a relatively small number of parameters, or features. These features should describe each segment in such a characteristic way that other similar segments can be grouped together by comparing their features. There are enormous interesting and exceptional ways to describe the speech signal in terms of parameters .Though, they all have their strengths and weaknesses, we have presented some of the most used methods with their importance.

Steven J. Anderson, A.C M Fong, senior member, IEEE, Jie Tang, member, IEEE, "Robust Tri-Model Automatic Speech Recognition for consumer Applications." IEEE Transactions on Consumer Electronics, Vol. 59, No. 2, May 2013. Commercial automatic speech recognition (ASR) started to appear in the late1980"s and can proposal a more natural means of receiving user inputs than methods such as typing on keyboards or touch screens. This is a especially eventful consideration for small consumer devices such as smart phones. In many practical circumstances, however, presentation of ASR can be significantly. Compromised due to ambient noise and variable lighting circumstances. Prior research has shown that adding visual signals to standard ASR can mitigate the effects of ambient noise. ASR using adaptations of established techniques such as MT, DCT and MFCC.

Ashok Kumar D., Ummal Sariba Begum T., "A Novel design of Electronic Voting System Using Fingerprint", International Journal of Innovative Technology & Creative Engineering (ISSN:2045-8711),Vol.1,No.1. pp: 12 19,January 2011Electronic Voting System that will automatically perform authentication validation and counting with the help of UIDAI. The proposed electronic voting system can be implemented along with the traditional election system. The proposed an approach that will use the information provided by UIDAI in electronic voting system. Is a Project Director at Contain Southampton, United Kingdom. His generation on Biometric technology such as fingerprint. The fingerprints are more secured technology. Those are use in smart e-voting to secure voting process. Fingerprint are use to match the voter data base otherwise voter cannot vote. The fingerprint technologies are using Chris Roberts in voting system.

Benjamin B., Bederson, Bongshin Lee., Robert M. Sherman., Paul S., Herrnson, Richard G. Niemi., "Electronic Voting System Usability Issues", In Proceedings of the SIGCHI conference on Human factors in computing systems,2003.The information provided by UIDAI in smart voting system. The proposed system procedure is carried out in mainly few stages: registration, verification and validation. These stages of proposed system are illustrated. the smart e-voting system has been done on fingerprints in humans. There are two fundamentally main goal that have risen from voting process (1) A person's fingerprint will not change the structure naturally after about one year after birth and (2) the fingerprints of individuals are different. Even the twins in fingerprints are not the same. In practice two humans with the same fingerprint have never been found.

### III.EXISTING SYSTEM

The existing voting procedure follows the principle of electronic voting machine (EVM) which has simple design, reliability and fast accessing characteristics. Unfortunately, due to hardware problems in EVM's invalid votes are being casted. Voting system must provide results quickly, but existing voting system takes much time to produce the result. Multi model biometrics is the fusion of two or more types of biometrics. High accuracy will be achieved by fusion of Face and Finger print recognition systems compared to present EVM system.

### IV.PROPOSED SYSTEM

The proposed EVM system has two inputs, one of the inputs is Face image and another is Finger print. Initially, in the Face recognition part, web camera captures the face image and the face region will be detected using the Viola and Jones algorithm. It consist of two switches one for enrollment and other for verification to activate the switches it must be connected to ground.

#### ALGORITHM:

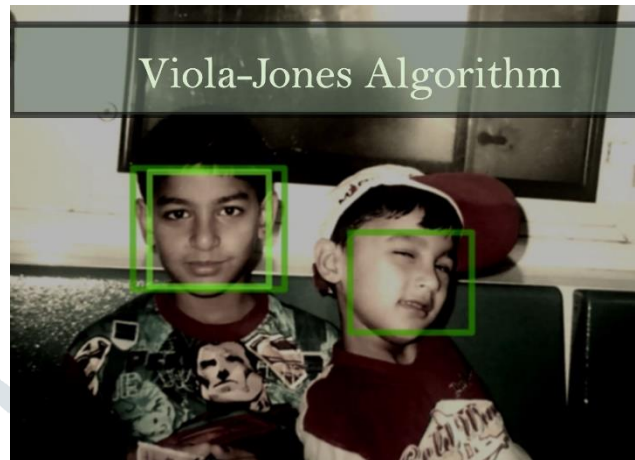
##### 4.1 Viola Jones Algorithm

Detection: Viola-Jones was designed for frontal faces, so it is able to detect frontal the best rather than faces looking sideways, upwards or downwards. Before detecting a face, the image is converted into grayscale, since it is easier to work with and there's lesser data to process. The Viola-Jones algorithm first detects the face on the grayscale image and then finds the location on the colored image.

Training: We're training the machine to identify these features. We're feeding it information, and subsequently training it to learn from the information to predict. So ultimately, the algorithm is setting a minimum threshold to determine whether something can be classified as a feature or not. The algorithm shrinks the image to 24 x 24 and looks for the trained features within the image. It needs a lot of facial image data to be able to see features in the different and varying forms. That's why we need to supply lots of facial image data to the algorithm so it can be trained. Viola and Jones fed their algorithm 4,960 images (each manually labeled). For some images, you can feed the mirror image of a particular image, which would be brand new information for a computer. You would also need to supply the algorithm non-facial images so it can differentiate between the two classes. Viola and Jones supplied their algorithm 9,544 non-facial images. Within these, some images may look similar to features in a face, but the algorithm will understand which features are more likely to be on a face and which features would obviously not be on a face.



(a)



(b)

Fig (a),(b):Viola Jones Algorithm

#### 4.2 Block Diagram

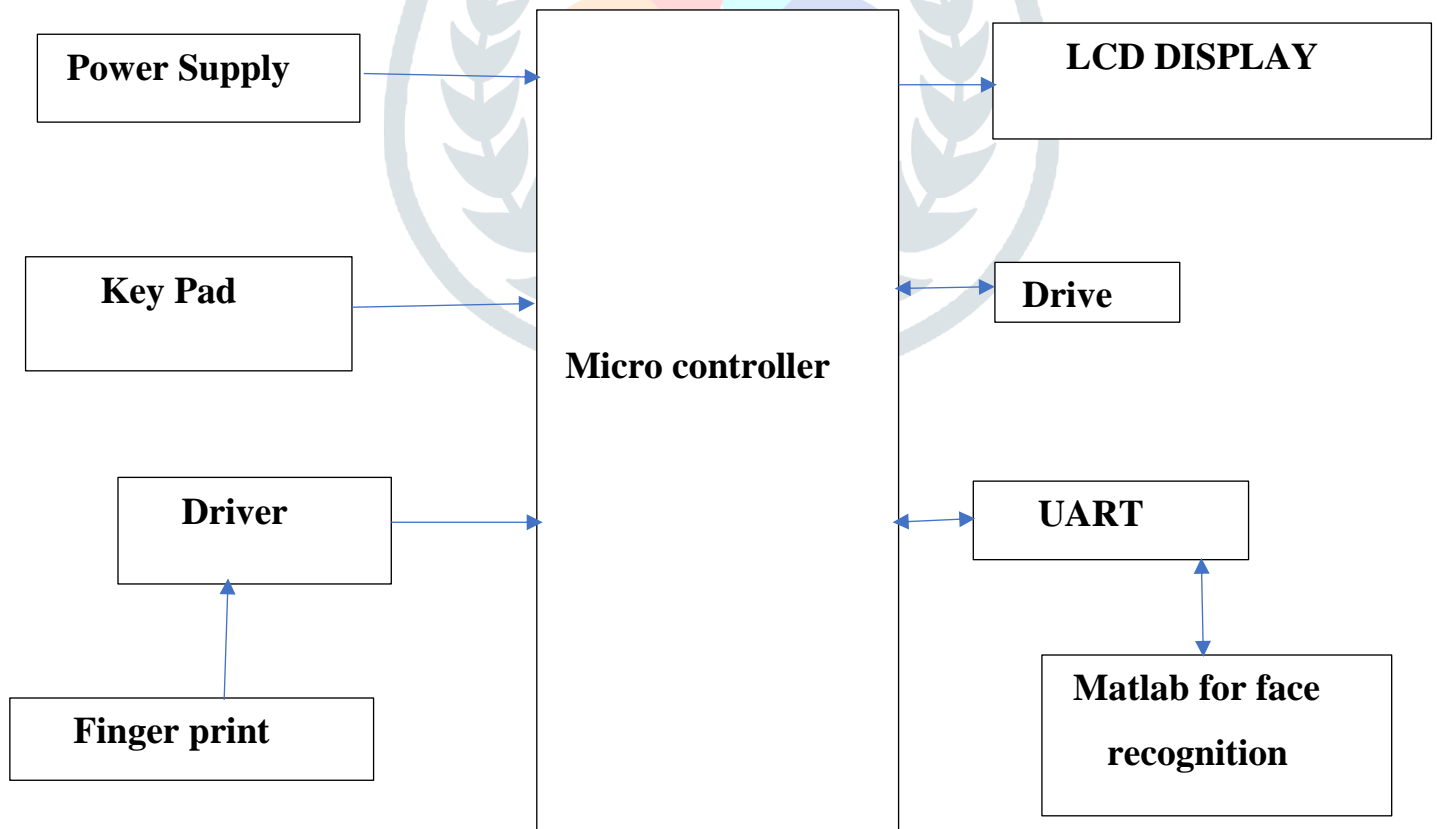
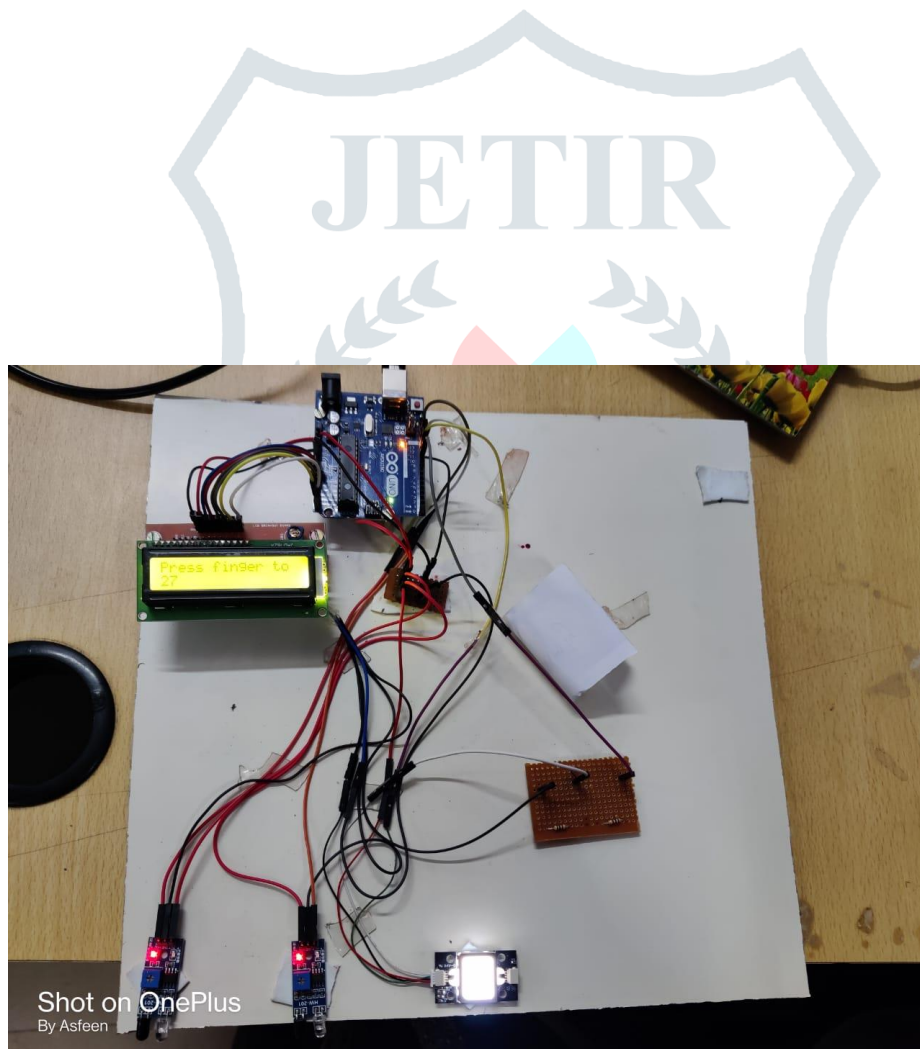
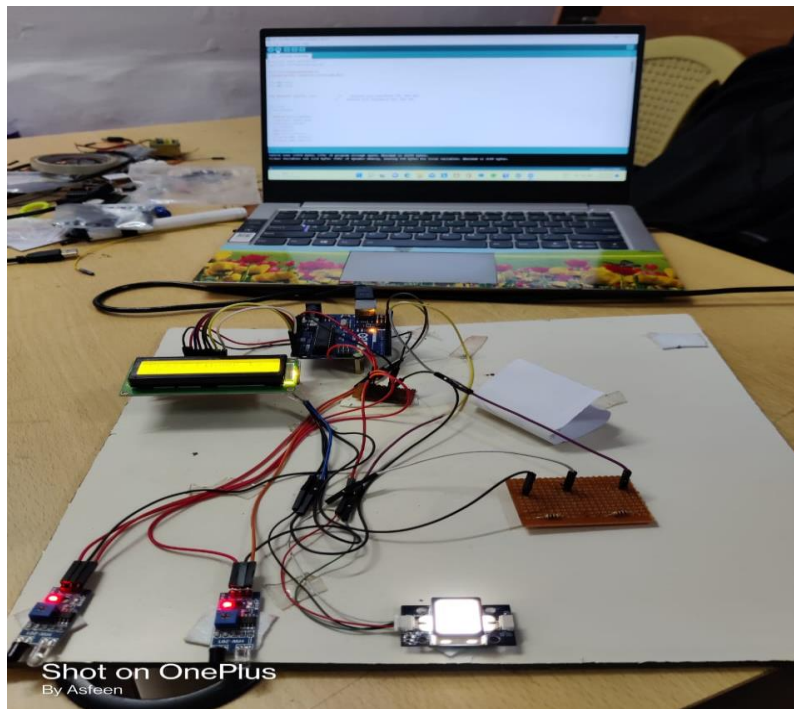


Fig. Block Diagram

## V.IMPLEMENTATION

The functional block diagram of the IoT based voting machine with fingerprint verification consist of controller, fingerprint module, Wi-Fi module, keypad, power supply. The controller used in this system is arduino Uno. Power is given to the system from the laptop. Keypad is used to poll the vote. Message regarding the system instructions and any malpractice will be displayed on the serial monitor. Fingerprint module is used to place the finger; it is used to store the database of the voter's fingerprint. Fingerprint module identifies the fingerprint of each user with the fingerprint in the database and displays a message if it belongs to an authenticated person. It will give the result of matching on the serial monitor. The ballot paper of the voting is stored on the cloud. The final count of each candidate is stored in different field in the cloud. Here, webpage is used to store the final count obtained by the candidate. ESP8266 is used to provide Wi-Fi to the controller. Finally result can be obtained in the serial monitor of the Arduino.





## Applications

- This project can be used as a voting machine to prevent rigging, during the elections in the polling booths.
- Fast track voting which could be used in small scale elections, like resident welfare association, “panchayat” level election and other society level elections, where results can be instantaneous.
- 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 the current situation, on a small scale basis.

## VI.CONCLUSION

Fingerprint Based Voting Machine is designed to make the procedure of voting easier and more convenient as it is a modified system. It has proved to be very advantageous in providing security EVM is capable of saving considerable printing stationery and transport of large volumes of electoral material. It is easy to transport, store, and maintain. It completely rules out the chance of invalid votes. In total, the complete system (including all the hardware components and software routines) is working as per the initial specifications and requirements of our project. So certain aspects of the system can be modified as operational experience is gained with it. As the users work with the system, they develop various new ideas for the development and enhancement of the project. The proposed system has been designed and implemented successfully using a PIC microcontroller, which was shown to be superior over the existing Electronic Voting Machine. The proposed system has the benefit of using a biometric authentication and controls the process of voting avoiding unnecessary things like rigging, ballot papers, casings etc.

## VII. REFERENCES

- S.Kumar and E. Walia, “Analysis of Electronic Voting system in Various Countries”, International Journal on Computer Science and Engineering, vol. 3(5), 1825-1830, 2011.
- Z. Pan, H. Bolouri (2010). fingerprint matching on Discrete Cosine Transform and Neural Networks. University of Hertfordshire, Herts, United Kingdom
- Dill D.L., Mercuri R., Neumann P.G., and Wallach D.S., "Frequently Asked Questions about DRE Voting Systems", Feb.2003.
- Voting system in India web portal (<http://www.voteforindia.co.in/evm.html>).
- Jain, K, Ross, A, Prabhakar, S (2004). An Introduction to Biometric Recognition. New York, USA.
- Jawad Nagi, (2009). Design of an Efficient High-speed fingerprint Recognition System. Final Year Project Proposal College of Engineering, University Tenaga National.
- Xiao Yun Jing and David Zhang (2009).A fingerprint Recognition Approach Based on minutiae DCT Feature Extraction. Nanjing University of Science.
- Bakshi U.A., Bakshi A.V., Bakshi K.A. (2007), Digital Image Processing, 1st ed. Pune: Technical Publications.
- Vishal Vilas Natu “Smart-Voting using Biometric “International Journal of Emerging Technology and Advanced Engineering”, Volume 4, Issue 6, June 2014.
- Virendra Kumar Yadav, Saumya Batham, Mradul Jain, Shivani Sharma “An Approach to Electronic Voting System using UIDAI “,2014 International Conference on Electronics and Communication Systems.
- Chris Roberts Biometric Technologies- fingerprint.
- Kashif Hussain Memon, Dileep Kumar and Syed Muhammad Usman, Next Generation A Secure E-Voting System Based On Biometric Fingerprint Method 2011 International Conference On Information And Intelligent Computing IPCSIT Vol.18 (2011)
- D. Ashok Kumar, T. Ummal Begum, 2011 “A Novel design of Electronic Voting System Using Fingerprint”
- Mary Bellis. The history of voting machines. About.com :Inventors, 2000.
- Jefferson D., Rubin A., Simons B., and Wagner D., “A Security Analysis of the Secure Electronic Registration and Voting Experiment (SERVE),” Technical Report, available at: <http://www.servesecurityreport.org>, last visited 2009.