

# FINGERPRINT BASED ADVANCED VOTING MACHINE USING GSM

Mr.L.JONES NIRMAL<sup>1</sup>, M.S.Vikram Madhavan<sup>2</sup>, C.Arul Murugan<sup>3</sup>, S.V.Charan Kumar<sup>4</sup>, M.Surya<sup>5</sup>

<sup>1-4</sup>UG student, Dept of Electrical and Electronics, Panimalar Institute of Technology, Chennai, Tamil Nadu

<sup>5</sup>Asso, Professor, Dept of Electrical and Electronics, Panimalar Institute of Technology, Chennai, Tamil Nadu

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**Abstract** - Biometric Finger print devices are used in the Electronic Voting machine for voter verification. We have designed a finger print based voting machine where there is no need for the user to carry his ID which contains his required details. The person at the polling booth needs only to place his Finger on the device, thus allowing the acquisition of an on-spot fingerprint from the voter which serves as an identification. This Finger print reader reads the details from the tag. This data is passed onto the controlling unit for the verification. The controller fetches the data from the reader and compares this data with the already existing data stored during the registration of the voters. If the data matches with the pre-stored information of the registered fingerprint, the person is allowed to cast his vote. If not, a warning message is displayed on LCD and the person is barred from polling his vote. The vote casting mechanism is carried out manually using the push buttons. LCD is used to display the related messages, warnings and ensuing results. And a message will be sent to the voter.

**Key Words:** Theft Detection, Arduino, GSM, GPS, IoT

## 1.INTRODUCTION

Biometrics is the science and technology of measuring and analyzing biological data. Biometrics refers to technologies that measure and analyze human body characteristics, such as DNA, fingerprints, eye retinas and irises, voice patterns, facial patterns and hand measurements, for authentication purposes. The field of biometrics was formed and has since expanded on to many types of physical identification. Among the several human fingerprints remain a very common identifier and the biometric method of choice among law enforcement. These concepts of human identification have lead to the development of fingerprint scanners that serve to quickly identify individuals and assign access privileges. The basic point of these devices is also to examine the fingerprint data of an individual and compare it to a database of other fingerprints [1]. In our project we have used fingerprint for the purpose of voter identification or authentication. As the thumb impression of every individual is unique, it helps in minimizing the error. A database is created containing the fingerprint images of all the voters as required. Illegal votes and repetition of votes is checked for in this system with accurate coding. Hence with the application of this fingerprint based EVM system elections could be made fair and free from rigging. Further that the elections would are no longer a tedious and expensive job.

This system is divided between the following terms: Electronic voting: Electronic machines are used to facilitate

vote without using paper ballots. We used biometric system for voting. Biometric is form of print made by an impression of the ridges of the skin of a finger .The module is a biometric finger print reader module (R305) that interface with arduino directly. Electronic vote counting: Electronic vote counting is displayed on LCD. We have implemented a system which is based on fingerprint scanning which would replace a traditional voting system i.e. ballot paper system. Fingerprint sensor is a module which captures fingers print image and then convert it into equivalent format and stores them into its memory on selected location in Arduino. Here all the processes are controlled by Arduino. Another name for fingerprint scanning is biometric. Biometric points towards the technologies that analyze human body characteristics such as finger print and many more for authentication purpose. Every single person has unique biometric impression. In organizations, educational institutes, co-operative banks, votes decided the committee and head of organization that is responsible for bright future. So we have implemented a new method of voting system to increase standard of living. Votes could be counted manually in current system so that there is more opportunity of manipulation and fraud such as duplicate counting and completely missed counting. False counting of votes could lead to impact on people mind-set towards the system.

## 2. Proposed System

Fingerprint based biometric voting machine is divided in to two parts, in first part user needs to register and in second part user will vote for desired candidate [1]. Block diagram is shown in "Fig.1". Enrollment in system is needed for every voter or user with the help of push button or key. For this process user needs to press ENROLL key and then LCD will ask for entering location id where finger will be store in arduino on specific memory location. UP/DOWN keys are needed to enter ID. For selection of ID OK key is provided. Fingerprint module will ask for the finger to be place over module. For proper identification LCD will ask to remove fingerprint from fingerprint module and again ask for placing the finger. Simultaneously with this process fingerprint module takes an image and convert it into proper format and store it by selected ID into the fingerprint module's memory. Now voter is register with the system and he/she can cast the vote to his candidate. Similarly all users will have to register. All this details are for single system, data of one system will be stored in that system itself there is not any mutual connection between two systems. All the systems are isolated from each other to avoid being hacked.

Voting process is divided into some simple steps. When user wants to vote then he or she needs to press match key and then buzzer will beep and at the same time LED will glow and LCD will ask for place finger over fingerprint module. That time user id will be store in Arduino. Now user can cast the vote, for that user again have to place finger over fingerprint module meanwhile module capture finger image find its id which is present in the system. If finger id detected then LCD will display authorized voter. It means the user is authorized voter and process will move to next step for voting. Now voter can vote their candidate by pressing selected key.

- ▶ LCD
- ▶ BUZZER
- ▶ PUSH BUTTONS
- ▶ POWER SUPPLY

**R307 Fingerprint**

Module consists of optical fingerprint sensor, high-speed DSP processor, high-performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.



Figure : 01



Figure :03

Block Diagram:

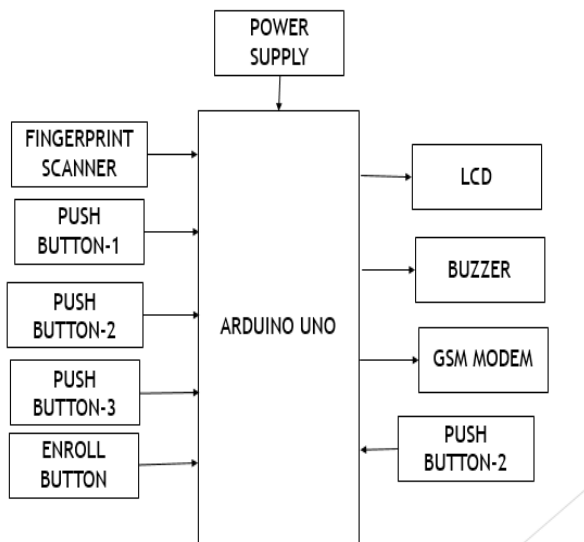


Figure :02

**HARDWARE REQUIREMENTS:**

- ▶ ARDUINO UNO
- ▶ FINGER PRINT SCANNER
- ▶ GSM MODEM

- Perfect function: independent fingerprint collection, fingerprint registration, fingerprint comparison (1: 1) and fingerprint search (1: N) function.
- Small size: small size, no external DSP chip algorithm, has been integrated, easy to install, less fault.
- Ultra-low power consumption: low power consumption of the product as a whole, suitable for low-power requirements of the occasion.
- Anti-static ability: a strong anti-static ability, anti-static index reached 15KV above.
- Application development is simple: developers can provide control instructions, self-fingerprint application product development, without the need for professional knowledge of fingerprinting.
- Adjustable security level: suitable for different applications, security levels can be set by the user to adjust.

Finger touch sensing signal output, low effective, sensing circuit standby current is very low, less than 5uA.

### 3. RESULTS AND DISCUSSION

#### Finger Print voting system kit:

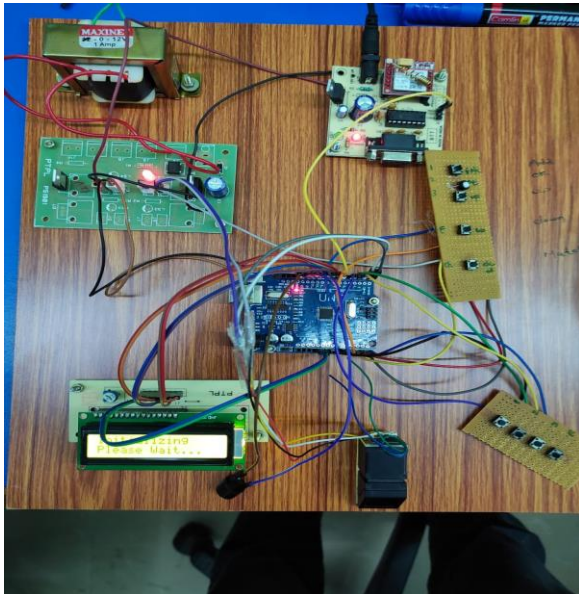


Figure :04

#### ENROLLING THE FINGERPRINTS:



Figure :05

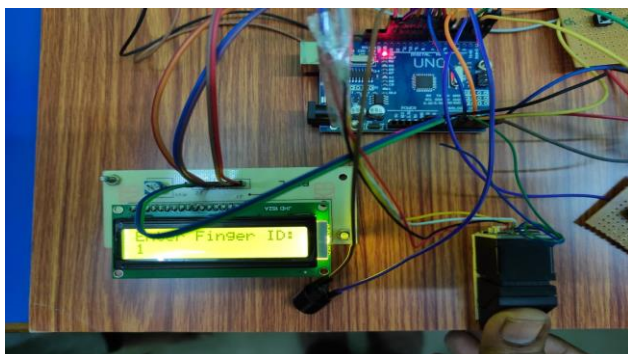


Figure :06

#### ENTER THE VOTE:

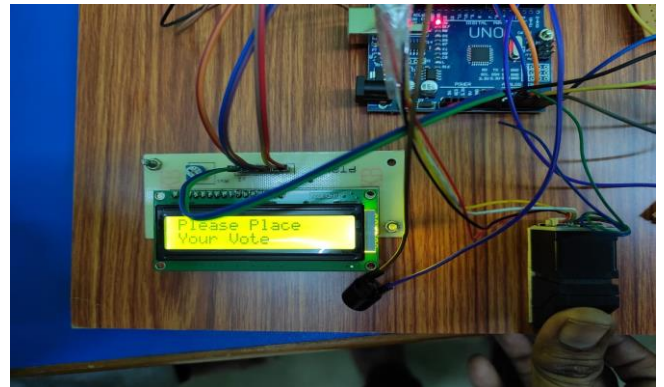


Figure :07

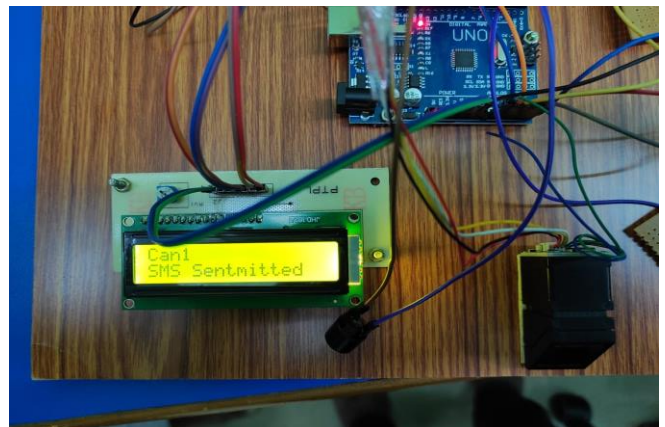


Figure :08

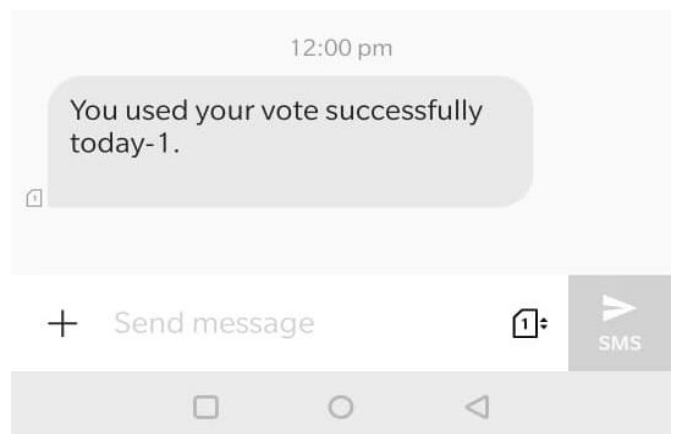
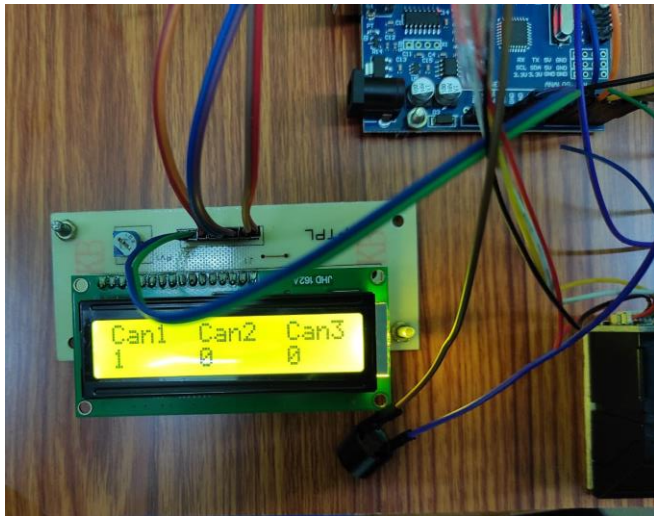


Figure :09

**CHECKING THE RESULT:**



**Figure :10**

**RE-ENTERING THE VOTE:**



**Figure :11**

**4. Conclusion**

The project “Fingerprint Based Voting Machine” was mainly intended to develop a fingerprint based advanced Electronic Voting Machine (EVM) which helps in free and fair way of conducting elections which are basis for democratic country like India. The hardware setup successfully implements the EVM with the help of Fingerprint sensor and Arduino. Result of voting count will be displayed on LCD. Operation shows innovative and secure process of voting. We have designed Biometric voting machine for small scale purpose like institutes and organization. This concludes that fingerprint is useful for voting.

**REFERENCES**

[1] V. Kiruthika Priya , V. Vimaladevi , B. Pandimeenal , T. Dhivya, “Arduino based smart electronic voting machine”, 2017 International Conference on Trends in Electronics and Informatics (ICEI) Year: 2017, conference Paper, Publisher: IEEE.

[2] Rahil Rezwani, Huzaifa Ahmed, M. R. N. Biplo, S. M. Shuvo, Md. Abdur Rahman, “Biometrically secured electronic voting machine”, 2017 IEEE Region 10 Humanitarian Technology Conference (R10- HTC).

[3] Prof. Sunita Patil, Amish Bansal, Utkarsha Raina, Vaibhavi Pujari, Raushan Kumar, “E-Smart Voting Machine with Secure Data Identification Using Cryptography”, 2018 Publisher: IEEE

[4] Annalisa Franco, “Fingerprint: Technologies and Algorithms for Biometrics Applications”, Year: 2011 , Course , Publisher: IEEE.

[5] A. Piratheepan, S. Sasikaran, P. Thanushkanth, S. Tharsika, M. Nathiya, C. Sivakaran, N. Thiruchelvan and K. Thiruthanigesan, “Fingerprint Voting System Using Arduino”, College of Technology Jaffna, Sri Lanka University College of Anuradhapura, University of Vocational Technology, Sri Lanka

[6] Rohan Patel, Vaibhav Ghorpade, Vinay Jain and Mansi Kambli, “Fingerprint Based e-Voting System using Aadhar Database”, 2015.

[7] S Wolchok, E Wustrow, JA Halderman. “Security analysis of India's electronic voting machines” 2010.

[8] Qijun Zhao, Lei Zhang, David Zhang and Nan Luo, “Adaptive Pore Model for Fingerprint Pore Extraction”, IEEE, 978-1-4244-2175 - 6/08.

[9] Md. Mahboob Karim, Nabila Shahnaz Khan, Ashratuz Zavin, Shusmoy Kundu, Asibul Islam, Brazab Nayak, “A proposed framework for biometric electronic voting system”, IEEE International conference on 2017

[10] Soumyajit Chakraborty, Siddhartha Mukherjee, Bhaswati Sadhukhan, Kazi Tanvi Yasmin, “Biometric Voting System using Adhar Card in India” 2016 .