

# ANTI RIGGING VOTING MACHINE

## A step towards rigging free voting

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**Abstract**—Now a days elections are not conducted by the usual fair processes through which people choose their Democratic Leader instead it becomes a war ground in most of the places in India. We can see that most parts which are affected with these problems are where the ruling political parties are unfairly cast fake votes and create violence using muscle power and influence. So we came up with a smart voting machine which helps us to conduct a proper and fair voting process and passively decreases the scope of violation taking place due to unfair Election process. Now a days every organisation has the biometric security or identification system. So we implement the biometric identification system along with the traditional EVM to make an advanced and highly secured voting system. It basically helps us to stop the fake voting and conduct a peaceful voting process.

**Keywords**—Anti rigging voting machine; Raspberry pi; Fingerprint reader; python; voting machine; rigging free voting; fare voting

### I. INTRODUCTION

Our system is going to change the present voting scenario, it would help us to reduce the fake voting as it would identify each and every voter before receiving their votes. Not only the system identifies the authorised voter but it also comes with a bunch of safety and security protocols. The system consists of a smart machine and the traditional EVM. The smart device

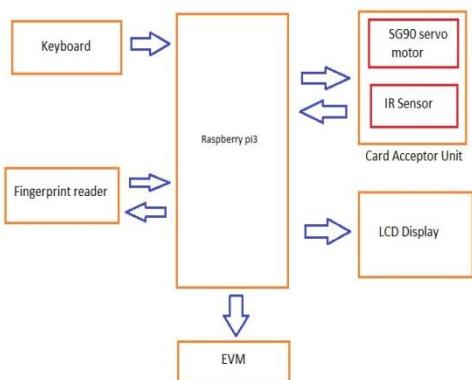
(ARVM) performs numerous tasks in very less time. First of all it asks the card holder for the voter id card number, after that the machine asks the card-holder to insert the card in the machine after which the machine checks its database if the card-holder is eligible to cast his/her vote in that particular booth or not. If the card-holder (voter) does not belong to that particular booth then the machine ceases the card and prompt a message showing that the user does not belong to that particular booth. If the voter belong to that booth then the machine go to the next security check and check if the voter has already casted their vote or not. If he/she has already casted their vote then the card is ceased otherwise the machine

proceeds to the next step and show the user data on the machine's display. After that the machine asks the user or voter to place his finger on the fingerprint reader and take the user finger impression and verify that from the local database inside the machine to verify the holder identity, that whether the voter's card is authentic or not. And if all of the above verification process is fulfilled properly then the machine activates the EVM and allows the voter to enrols their vote. Otherwise if throughout the verification procedure identifies any issue regarding the card then the card is ceased and the card holder should bring the card back from the court after paying the penalty. In this process there is a very less chances of any rigging or violation as each and everything is done by the ARVM itself and if the container having ceased cards is tampered with or its seal is broken than the machine locks itself. And as without the ARVM, the EVM doesn't activate so no fake votes can be casted. The system gets activated only at the predefined particular date and time so no one can cast their votes before that. The system also uses very minimum human resources during the full voting process as a result of which the system becomes very secure.

### II. DEVELOPMENT OF HARDWARE AND SOFTWARE OF ANTI RIGGING VOTING SYSTEM USING RASPBERRY PI AND FINGERPRINT READER

The block diagram of the Anti-Rigging Voting System using raspberry pi, fingerprint reader and all other mechanical and electronics parts is shown in the figure 1 and the final machine in figure 2. The AntiRigging Voting System consists of the mainly following units. They are

1. Raspberry pi
2. Fingerprint module
3. LCD display
4. Keyboard
5. Card acceptor unit



**Figure 1.** The block Diagram of the Anti-Rigging Voting System using raspberry pi, fingerprint reader



**Figure 2.** Working prototype of the machine

The description of each of these units and their interfacing in this system as presented below.

#### A. RASPBERRY PI

Raspberry pi is a small pocket size computer, developed in UK by raspberry pi foundation. It has 1.4 GHz processor and 1 GB of ram. Basically this small computer has a bunch of USB and communication ports. It features a Broadcom system on a chip (SoC) with integrated ARM compatible central processing unit and on-chip graphics processing unit (GPU). This raspberry pi runs on Raspbian OS which is a distribution of Linux OS. Most of the programming done on this platform is using Python programming language. This single-board computer comes with 40 GPIO pins which makes it very handy for the research and project development purposes. The software we developed runs on this raspberry pi

which does all the tasks required to archive the goal of our project.

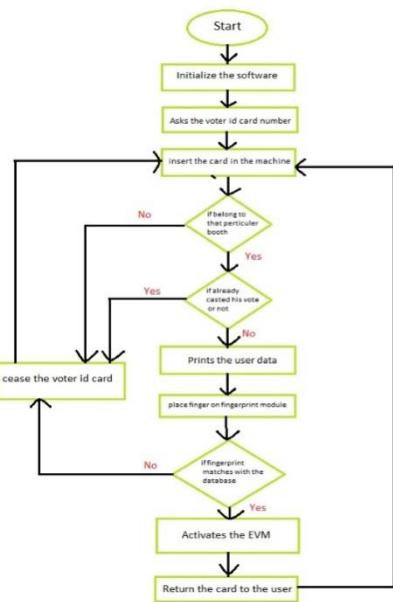


**Figure 3.** Raspberry pi3

Algorithm and Flow chart for Anti Rigging Voting Machine as presented below.

1. Raspberry pi starts the software we developed and prints the User Interface on the display.
2. The UI asks for the voter id card number and after getting the number it asks to insert the card in the card slot.
3. After that the software checks the voter id card number with some databases to perform the security protocols.
4. If the voter belong to that particular booth then the system gofor the next security check otherwise it ceases the card.
5. If the voter has already casted their vote then the machine ceases the card otherwise the system goes for the next security check.
6. Now the software searches the user data on the database and print it on to the display and asks for the fingerprint to verify the authentic user.
7. If the fingerprint matches with the database's data then the system activates the EVM and enrol the card number on a database which consists all the already casted voter id card numbers. And if the fingerprint is not matched then card will again be ceased.

The process of Anti rigging voting machine is presented figure below.



**Figure 4.** Flow chart of Anti rigging voting machine

#### B. Fingerprint Scanner -TTL (r307)

The module itself does all of the heavy lifting behind reading and identifying the fingerprints with an on-board optical sensor and 32-bit CPU. All need to do is send it simple commands. When the software asks for the fingerprint from the user at that time raspberry pi activates the fingerprint reader and waits for a reply from the reader. As soon as the reader sense any fingerprint impression the module generates a template along with a key which is then send to the raspberry pi through the USB-TTL converter. Which helps the raspberry pi for the authentic user verification process.



**Figure 5.** Fingerprint module- TTL (r307)

#### C. LCD Display

We have designed a user-friendly User Interface for this machine and also to show the running process or the details of user we needed a display unit so we chose a 4.3 inch LCD display. It makes the machine very easy and handy to use as it has very simple UI. This display is powered by a 12V 1amp power supply which uses Video frequency: PAL/NTSC to communicate with the raspberry pi.



**Figure 6.** 4.3 inch LCD Display

#### D. Keyboard

In present working prototype a normal USB keyboard is used and it provides a useful human interface component with the raspberry pi to feed the voter id card number.



**Figure 7.** USB Keyboard

#### E. Card acceptor unit

This card acceptor unit is basically has a mechanism which performs various tasks like

- It accepts the card from the user and holds it until any action is needed.
- It return back the card to the user if all the process done successfully.
- It can also cease the card if any of the security process remain unfulfilled.

The card acceptor unit also has an inbuilt IR sensor which detects if the card was inserted properly to the machine or not and sends that data to the raspberry pi. And all the mechanical movements are done using a sg90 servo motor.



Figure 8. Card acceptor unit

### III.SOFTWARE

The software of this project is written using python programming language as it is one of the most powerful programming language. This software has two different layers

- The frontend (user interface)
- And the backend

It has a very simple and responsive user-interface which makes the software very easy to use. And in the back end side the software performs all the security checks, database handling and hardware management tasks.

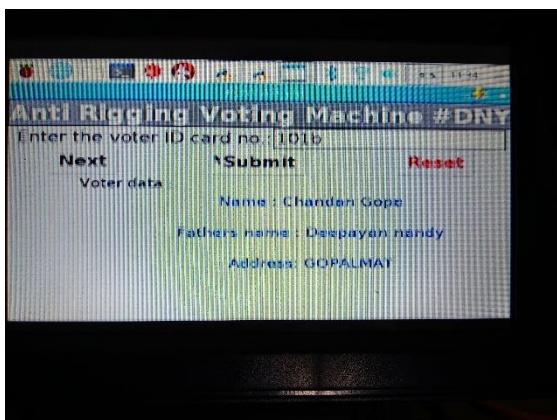


Figure 9. Frontend of the Software (UI)

```

1  from tkinter import *
2
3  val1=0
4  val2=0
5  do = 0
6
7  ##### defining window #####
8  my_window = Tk()
9  t1= Frame(my_window)
10 t2= Frame(my_window)
11 t3= Frame(my_window)
12 t4= Frame(my_window)
13
14 my_window.title("Anti Rigging Voting Machine")
15 #my_window.geometry("1020x780")
16
17
18 ##### commands #####
19
20 def b0c():
21     val1=val_2['text']
22     val1=(val1 + 10 )+0
23     val_2['text']= val1
24 def b1c():
25     val1=val_2['text']
26     val1=(val1 + 10 )+1
27     val_2['text']= val1
28 def b2c():

```

Figure 10. Backend of the Software

### Acknowledgment

The developed system is tested in our laboratory using some real voter id card and the fingerprint of the card holders. And we found that the system works properly. The main motto of this paper is to spread the concept that how we can implement some modern features along with the traditional EVM to perform peaceful and proper voting process. The future work of the paper is planned to develop in addition with another important Bio-metric parameter that is a scanner for visual identification of the card holder. And also we are looking forward to make this machine more portable and more stable.

### References

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