

Smart Voting Through Face Detection and Recognition

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Abstract:

The main aspect of democracy of a nation is the VOTE by which people elect their favorite candidate to rule the nation. Intervention of illegal practices will lead the nation to wrong hands. There are several methods adopted by the government to avoid crimes during voting. But the untouched area without proper security is the verification process. This process is still done manually in our country and there is a huge manpower requirement. This paper mainly helps in resolving difficulties and crimes involved in verification process. In this system a database containing the details of the voter,

face details are collected prior and stored. The voter is given an RFID card which will serve as a voter ID card for the individual and contains details about the person. During the day of voting the voter will undergo a two-level verification process. The voter & RFID card is first read by an RFID reader, the details of the person are displayed on the LCD and then the voter is asked to verify his Face. The voter & RFID face is recognized and matched with the existing database then he is eligible to cast his vote.

Keywords: RFID Reader, Arduino UNO, Camera, Face Recognition.

Introduction:

INDIA is a democratic country where every citizen above 18 years of age is eligible to elect their leaders. When a person's age becomes 18 they have the constitutional right to voluntarily enroll for voter ID given by the Indian Election Commission (IEC). Nowadays with the rise in population the need for checking the validity of the voters has become a problem. As the modern communications and Internet, today are almost accessible electronically, the computer technology users, brings the increasing need for electronic services and their security. This new technology refers to electronic voting systems where the election data is recorded, stored and processed primarily as digital information. Therefore, the necessity of designing a secure e-voting system is very important. Usually, mechanisms that ensure the security and privacy of an election can be time-consuming, expensive for election administrators, and inconvenient for voters. The proposed strategy for voting is more secure than the current methods. In this proposed system face detection and RFID is utilized to recognize the specific individual.

Proposed System:

This project aims to build a Web-based Voting System using Face Recognition. This project is used to maintain High level security. The voter details are stored in database in computer.

Before entering the premises that person should swipe RFID card on to RFID reader, the RFID reader sends a character associated with the RFID card.

After sending the character to the Arduino UNO, the Arduino UNO uploads the character. After receiving the character from Arduino UNO, the tasks for face authentication if the character obtained from it and the Arduino UNO is same then he is valid person, he will be allowed to vote. In this project we can overcome the problem prevalent in the existing system, such as proxy votes, missing identity, security, high cost and helps people to vote from many booths to his respective constituency.

To overcome above stated problems, we are proposing a voting system which is more secure, time saving and provides two levels of authentication by electronic means based on individual Face pattern recognition of voters. The new system will use face pattern of the voter as authentication by which at the time of election if scanned face pattern data of the voter matches with that of saved in the system, then he is allowed to vote otherwise he is rejected and reported as a fake voter. In this system if the same voter comes to vote for a second time, then the message will display as Already voted. The

proposed approach his time saving and provides much better authentication.

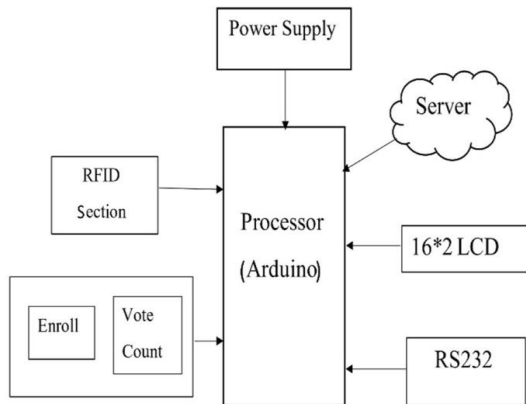


Fig: Block Diagram of smart voting system

Flowchart of Proposed system:

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. Each of the 14 digital pins on the Uno can be used as an input or output, using pin mode(), digital write (), and digital read () functions. They operate at 5 volts. In our project, the Arduino is used as the main microcontroller for receiving the data from the RFID module and it also receives the face data using the mat lab and compares it with face of the user. If the data matches, then it allows the user to cast the vote.

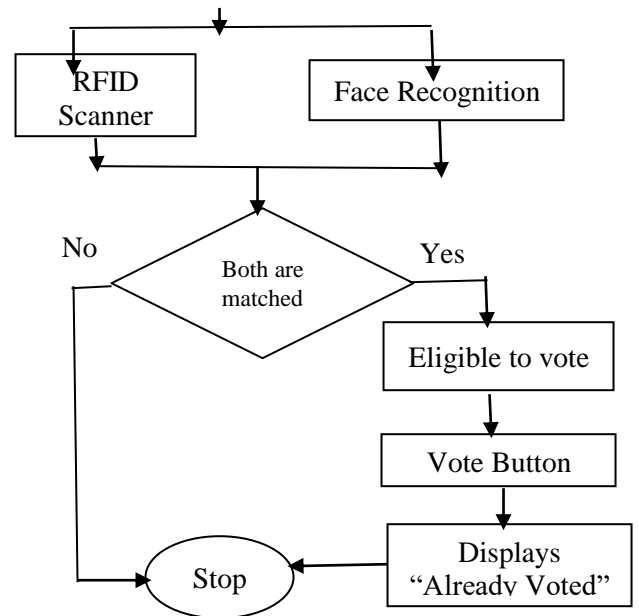
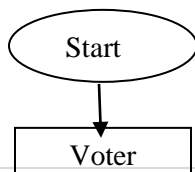


Fig: Flowchart of Proposed system
Description of Components:

Arduino Uno:

Once the voter enters the booth. He needs to go through first mode of authentication i.e., RFID reader, where he needs to scan his RFID card which sends the respective face which is stored in the data base to Arduino and then allows second mode of authentication i.e., face recognition using Python. The new system will use face pattern of the voter as authentication by which at the time of election if scanned face pattern data of the voter matches with that of saved in the system then he is allowed to vote otherwise he is rejected and reported as a fake voter and law breaker. Once the face is matched then the login page with start button

will be displayed indicating that the voter can proceed to vote. If the user tries to vote for the second time, then the message 'Already Voted' will be displayed.

LCDDisplay:

ALCD is a flat-panel display or there electronically modulated optical device that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. Once the RFID reads the data, the LCD will display the user data.

RFID:

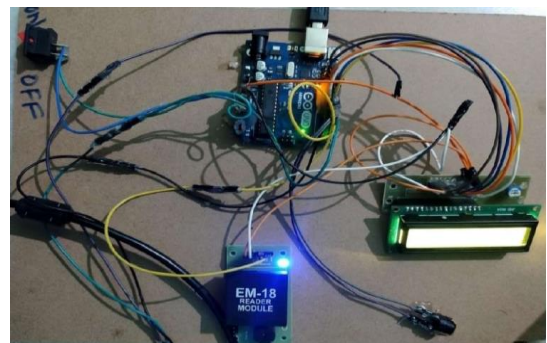
RFID tagging is an ID system that uses small radiofrequency identification devices for identification and tracking purposes. One important feature enabling RFID for tracking objects is its capability to provide unique identification. A tag which is composed of a semiconductor chip and an antenna. An interrogator (sometimes called a read/writer device), which is composed of an antenna, a RF electronics module, and a control electronics module. It is used for first mode of authentication. The voters are provided RFID cards which have a unique code for authentication.

Power supply unit:

The circuit needs two different voltages, +5V, +12V to work. These dual voltages are supplied by this specially designed power supply. The main object of this 'power supply' is, as the name itself implies, to deliver the required amount of stabilized.

Result:

The proposed system allows the voter to vote from anywhere using RFID and face authentication. Here the voter does not need to go for a particular place to vote for a particular candidate. By visiting the nearest polling



booth the voter can vote to his own constituency rather than visiting the constituency. This system avoids voting multiple times by the same voter and thus helps to avoid malpractice.

Fig 1: Bench setup of smart voting through face detection and recognition

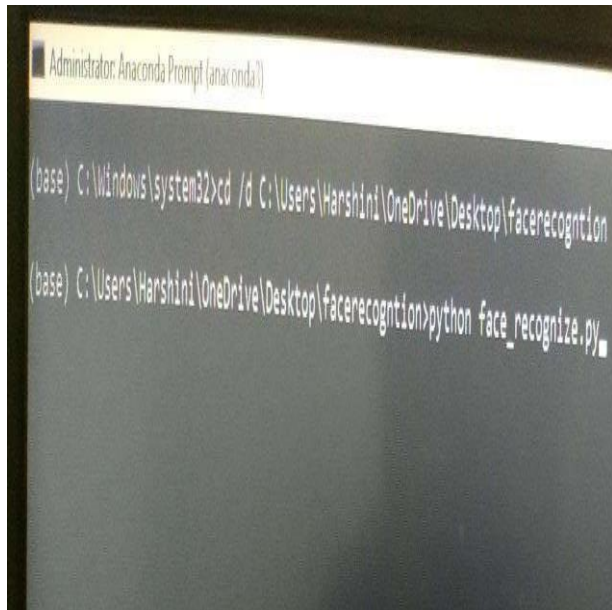


Fig 2:FileextractionofFacerecognition



Fig 4:FaceRecognition



Fig 3:RFIDAuthentication

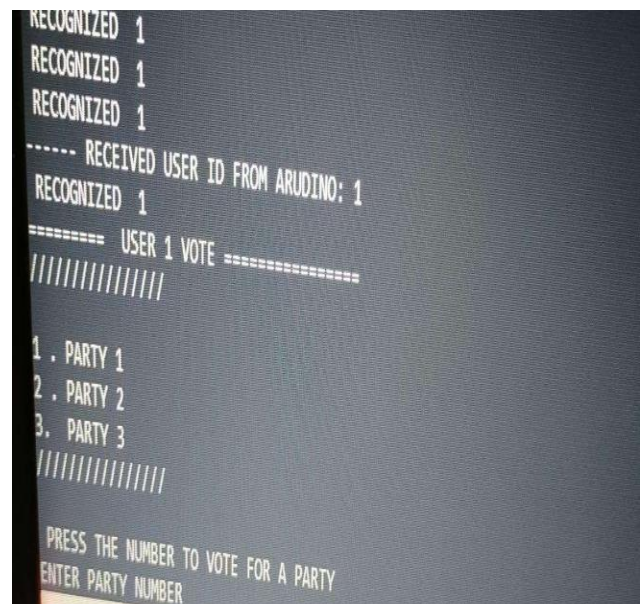


Fig 5:VotingProcess

Conclusion:

Theproposedmethodistodevelopasecurevoting system based on face recognition whichtriedtoovercomeallthedrawbackoccursintr additionalorcurrentvotingsystem.Theproposedsys

tem has many strong features like correctness, verifiability, convenience etc. For this system no requirement of an election officer, paper ballot or any electronic voting machine only the RFID cards are required. The proposed system provides two phases of authentication. First through RFID and second is Face Recognition.

In this system no voter can vote twice because the voter's facial patterns will be linked to their RFID. So that any user tries to vote twice with some other person's RFID card it is not possible due to RFID linked to the respective facial patterns stored in data storage will not be matched with the voter trying to vote with some other person's RFID.

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