

IOT BASED REMOTE ELECTRONIC VOTING SYSTEM USING AADHAR AND DUAL BIOMETRIC AUTHENTICATION

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Introduction:

It is fair to say that Democracy and voting go hand in hand. Enabling maximum voters to take part in the election process is our primary goal. Electronic Voting Machines (EVM) have become a part of India's election system since 1999, having replaced paper ballots and manual counting of votes. The government tries its best to spread awareness among the citizens about importance of voting, but due to some reasons some citizens wouldn't be able to cast their valuable vote. We propose a model wherein we allow voters to cast their vote towards their allotted constituency, from any other constituency.

Objectives:

1. To review the existing model of EVM
2. Upholding Democracy as a factor for development of the nation.
3. To establish use of RFID based Smartcard for identity purposes.
4. To implement efficient dual biometric verification for the voting process
5. To design a smart voting system to enable voting from any constituency
6. User friendly environment with secure database
7. Efficient and accurate calculations of voting results
8. Adapting new methods to reduce human effort

Methodology:

The methodology of our proposed model is as follows:

1. Sensor based Alcohol detection using MQ3 sensor, for detection of ethanol in air.
2. RFID based Smart card as an alternative for Voter ID and Aadhar.
3. Obtaining details of the voter including Name, Constituency, and Biometric data
4. Dual Biometric authentication occurs in two steps:
 - Optical Fingerprint sensor for fingerprint authentication
 - Haar and LBPH based face recognition algorithm

5. Once Smartcard (RFID tag) is verified and both fingerprint and face data is matched, constituency of voter will be displayed
6. The vote cast towards a particular candidate is updated in a secure server and the voter's name is tabulated to ensure same person does not cast vote again.
7. After the vote is cast, the EVM is reset, and the next voter can begin the process of voting again.
8. Admin is provided with his own Smartcard (RFID tag) along with fingerprint verification. Only the admin, upon successful fingerprint matching will be allowed to view results in a separate server.

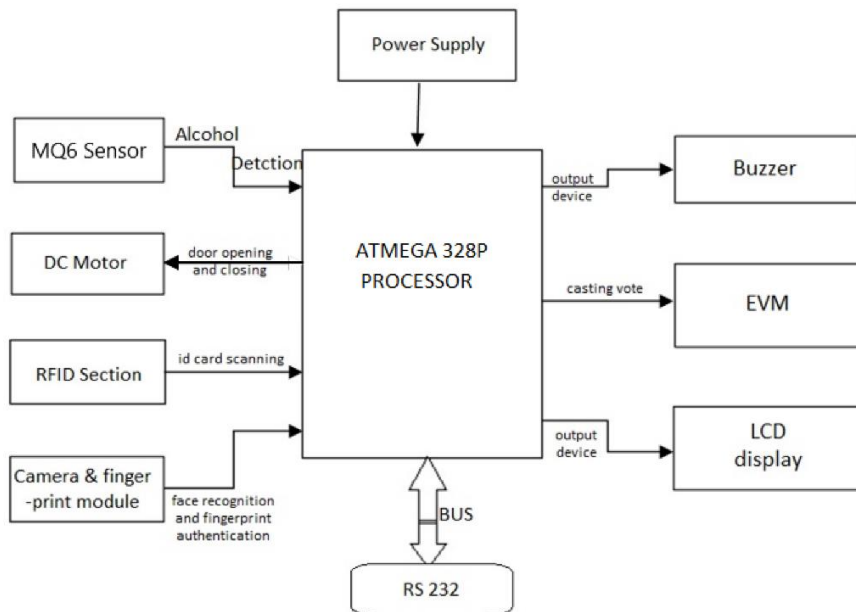
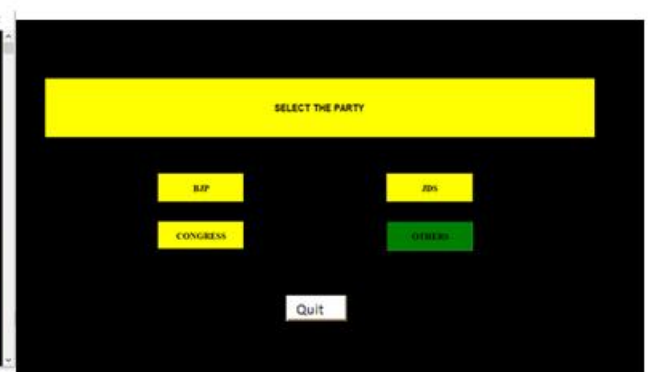
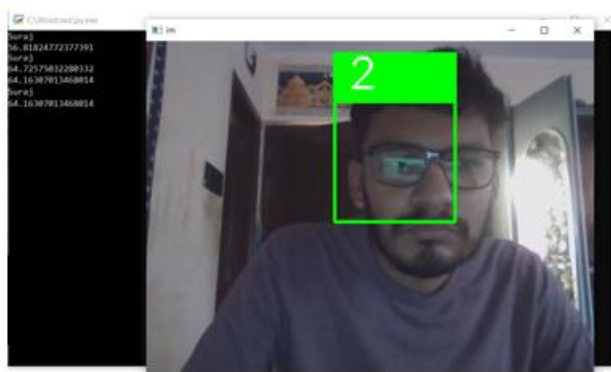
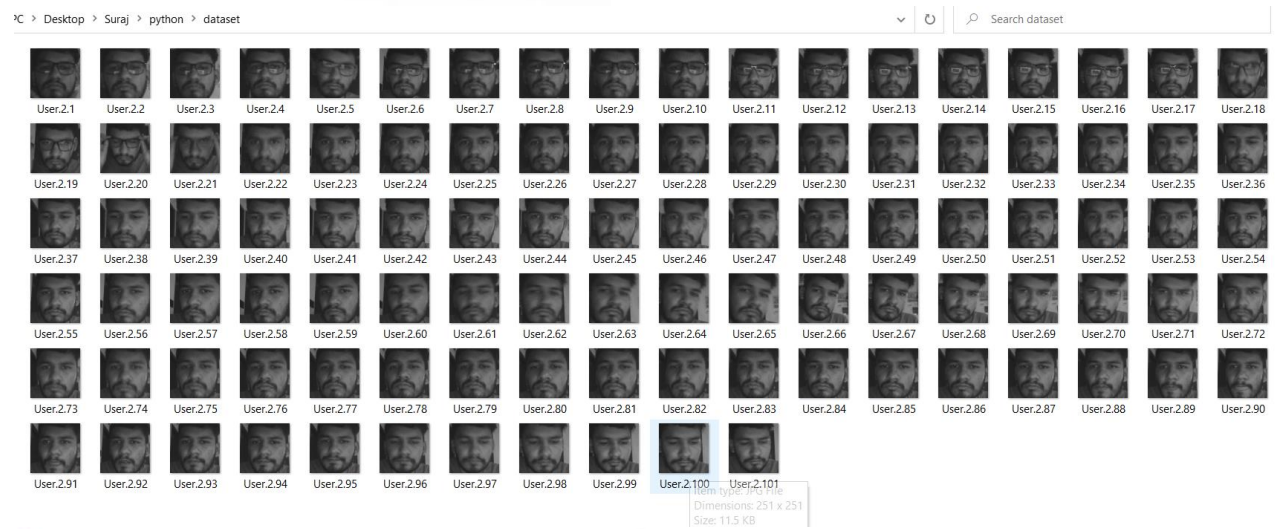
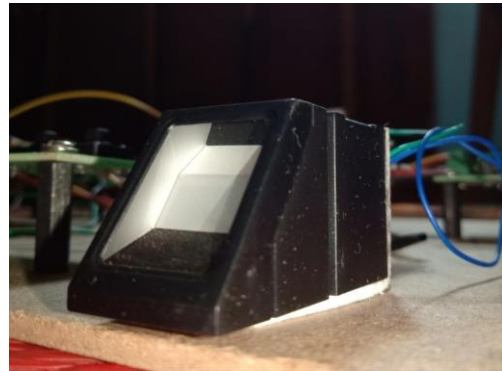
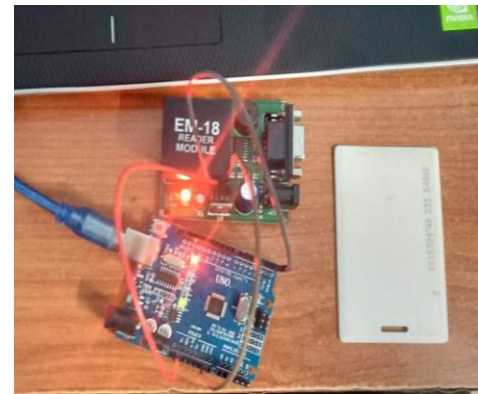
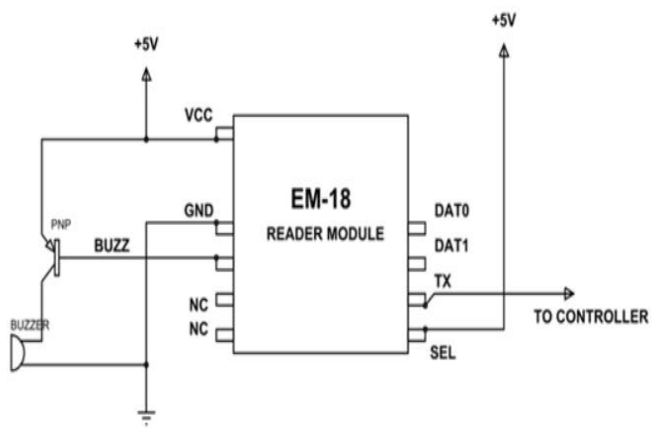


Fig 1. Circuit Diagram

Results:

1. Existing voting system have flaws as well as requirement of huge manpower. In order to provide better security and enable safe voting, we have dual biometric authentication, namely fingerprint authentication followed by face recognition.
2. The AS606 optical fingerprint reader, under ideal conditions has very high accuracy, with False Accept Rate (FAR) of only 0.001% and a False Reject Rate (FRR) a mere 1.0%.
3. When tested by inputting an image, the Haar cascade and LBPH algorithm works with 90% accuracy. However, as proposed project is for a prototype, due to low resolution of laptop camera, the obtained accuracy is only 70%.
4. The final polling results will be accessible only by the Regional Admin, who can check the results for his constituency after finger verification.



Scope for future work and Conclusion:

1. In a democratic country especially like India, election plays a vital role in deciding the future of the nation. Proposed system can be built by using existing EVM's, thereby reducing costs as well as making use of existing devices (E-waste reduction)
2. Said system can be implemented in hybrid methods in the future. As soon as majority of the population will have access to smartphones and internet connectivity, a new election system where in, each person phone is becomes the voting booth, and he/she can vote by sitting at home.
3. Furthermore, the same model can be modified for other applications like airport security and ticket checking, automation of parking lots, employee attendance and work tracking in high security firms and companies; and so on.