

# IMPLEMENTATION OF 2 LEVEL EFFECTIVE SECURITY VOTING SYSTEM

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## Abstract:

Elections are fundamental defining characteristics of any democracy that is being governed by the people expressing their choices in the form of voting. This project aims to build a two-level effective security voting system i.e., Face recognition and Aadhaar authentication technology, this project allows the eligible voters in INDIA to cast their vote by going to their respective constituency. This project implemented face recognition and Aadhaar authentication. The eligible voter details are stored in the memory. Initially the voter entering the voting process the voter should stand in front of the camera, the camera will read the image of the voter. After reading the voter image it will check the stored database the voter is in data base or not. If the voter image matches to stored data base the system will be approve the voter for second verification i.e., the system verifies their Aadhaar authentication by entering the Aadhaar number through the keypad. If both image and Aadhaar number matches with the data base then the system allows the voter to cast their vote through the switches. In the “Two Level Effective Security Voting System” once a voter cast the vote, it gives the display of confirmation message that your “vote is successful”. If the voter image or Aadhaar number does not matched to the database the display shows “unknown” and the buzzer gives beep sound. If a voter tries to vote once again using face and Aadhaar samples, the display shows that “already voted” and buzzer gives beep sound.

**Keywords —Microprocessor, Microcontroller, Embedded software, Sensors, Actuators.**

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## I. INTRODUCTION

The primary aim of this project is to develop a two-level effective security voting system designed to reduce unauthorized participation in elections through the dual verification of a voter's identity using facial recognition and the Aadhaar

number. The Aadhaar system, which assigns a unique 12-digit ID to each Indian citizen based on biometric and demographic data, serves as a foundational element of our security strategy. By integrating this with cutting-edge facial recognition technology, the system ensures that each vote cast is legitimate and traceable to a verified voter, addressing key issues of voter fraud and

impersonation that have plagued previous voting methodologies.

Our proposed system architecture includes detailed designs for voter-side applications, robust server infrastructure, and secure intermediary components that collectively enhance the security and integrity of the voting process. The technologies selected, including web-based interfaces and advanced encryption methods, are aimed at ensuring the system is accessible, user-friendly, and resistant to tampering. Special emphasis is placed on the user authentication and authorization process, wherein each voter must pass through rigorous checks during voter registration and while casting votes, further fortified by a second-level verification to minimize any potential security breaches.

## **II. LITERATURE SURVEY**

Chen, Z., Guo, X., & Zhang, J. [1] in 2018 have designed a working model of Smart Voting System Using Facial Recognition the increasing popularity of electronic voting systems has raised many security concerns regarding voter privacy, reliability and authenticity. In this paper, we propose a smart voting system that uses facial recognition to authenticate voters and ensure the security and privacy of voting data. The proposed system comprises of two main components: a facial recognition module and a secure online voting platform. The facial recognition module is used to authenticate the voter's identity by matching their face with the face stored in the government's database. The secure online voting platform enables voters to cast their vote from any location using their personal device, such as a smartphone or tablet, through a secure and encrypted connection.

Pramod, V. K., & Nandini, N. [2] in 2020 have designed a working model of A Survey on Face Recognition Based Electronic Voting System it is an emerging technology that uses facial recognition to authenticate voters and provide a secure and reliable voting. In this paper, we present a survey of

the latest developments and advancements in the field of face recognition-based electronic voting systems. The various approaches and techniques used in these systems. The facial recognition module face with the face stored in the government's database.

Zhang, X., Hu, M., Zhang, Y., & Jiang, B. [3] in 2020 have designed a working model of Research on face recognition based electronic voting system the face recognition-based electronic voting system is a promising technology that offers an efficient and secure voting system. In this paper, we propose a novel face recognition based electronic voting system that uses the deep learning algorithm to recognize the voter's face and ensure the security and privacy of the voting data. The proposed system offers a user-friendly interface and real-time feedback, making it easy for voters to use and understand.

Al-Samarraie, H., Al-Samarraie, N., & Al-Saidi, F. [4] in 2019 have designed a working model of Facial recognition-based electronic voting system electronic voting systems face numerous security and privacy challenges. In this paper, we propose a facial recognition-based electronic voting system that provides privacy protection and ensures voter authentication and tamper-proofing. The proposed system. uses encryption techniques to protect voter privacy.

Farooq, M., Javaid, N., Javaid, A., Qasim, U., & Khan, S. U. [5] in 2020 have designed a working model of Blockchain-based secure voting system using face recognition electronic voting systems face numerous security and privacy challenges. In this paper, we propose a secure voting system that uses facial recognition and blockchain technology to ensure voter authentication, tamper-proofing, and transparency. The proposed system uses facial recognition to authenticate voters and records the voting results on the blockchain to ensure tamper-proofing and transparency.

## **III. PROPOSED SYSTEM**

The proposed system integrates strong security measures to ensure the voting process. In

this technology, authorized voters are required to undergo dual verification through facial recognition and Aadhaar authentication. initially the voter should stand in front of the web camera, that will read the image of the voter. After reading the voter details it will compare to the stored authorized voter details. If face matches grant them to Aadhaar authentication. If both matches to stored data then only eligible voter is ready to cast their vote. In the event of a mismatch the face data or Aadhaar, an alert is triggered through a buzzer signal for fraud activity. After dual success they will vote on by switches. By these dual authentication measures, the proposed EVM not only enhances the security of the voting process but also ensures a more accurate and reliable election system. This innovative project aims to give more confidence in the election process by these advanced dual verification technologies for a secure and tamper-proof voting experience. After completing the voting process, the display shows that voted saved successfully.

#### IV. IMPLEMENTATION/EXPERIMENTAL SETUP

Set up a computer equipped with a camera to implement facial recognition and a database to manage voter details. Develop a program that interfaces with the facial recognition software to authenticate voter identities. Enable voters to enrol in the system by capturing their facial images and linking these with their Aadhaar numbers in the database. On election day, the camera captures voters' faces as they approach the system. The software then compares these images against the stored database to confirm each voter's identity. Upon successful identity verification, voters can proceed to enter their Aadhaar number. If both the facial match and Aadhaar number verification are successful, the voter is cleared to vote. Implement robust security protocols to deter fraud, including restricted database access, data encryption, and restricted system access to authorized personnel only. Initially, test the system with a small group to ensure its accuracy and reliability before expanding its use. Train staff on system operation and troubleshooting. Provide voters with clear

instructions on how to register their faces and vote using this new system.



FIG: EXPERIMENTAL SETUP

### V. RESULTS

#### 1. DATA COLLECTION

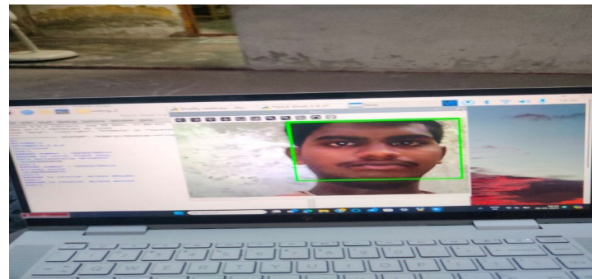


FIG: DATA COLLECTION

Before the elections the voters' data i e., face sample and Aadhaarnumber will be collected tostore in database. The Data collection is shown in fig.

#### 2. TRAINING THE DATA

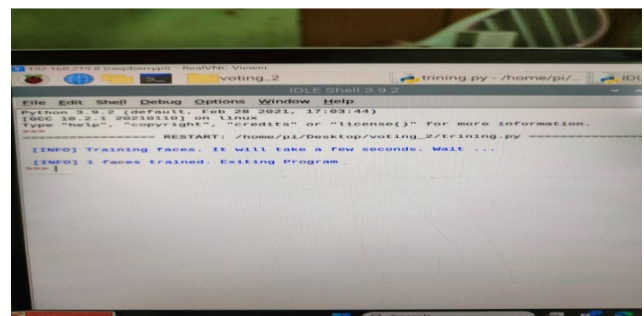


FIG: DATA TRAINING

After the data collection, it will train the data face samples, it takes few seconds to train the data. After training is successful it will show face trained as shown in fig.

### 3.FACE DETECTION

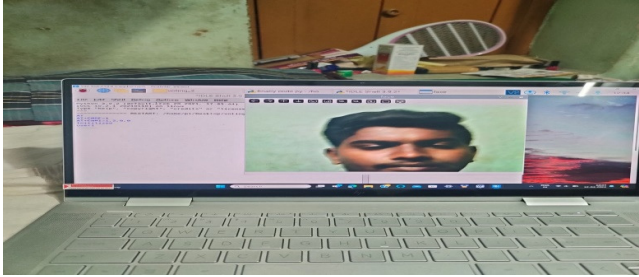


FIG: DETECTION OF FACE

In face detection process shown in fig 5.3 the voter's face is captured by a camera, and the system compares it to the database of registered voters to ensure that the person attempting to vote is indeed in registered voters.

### 4.ENTER VOTER AADHAAR NUMBER

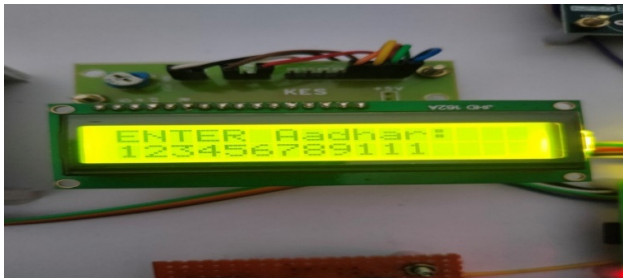


FIG: AADHAAR NUMBER ENTRY

After the face detection is successfully completed. The system will display "Enter Aadhaar" as for shown in fig then Aadhaar number is entered through the keyboard.

### 5.PLEASE PLACE YOUR VOTE

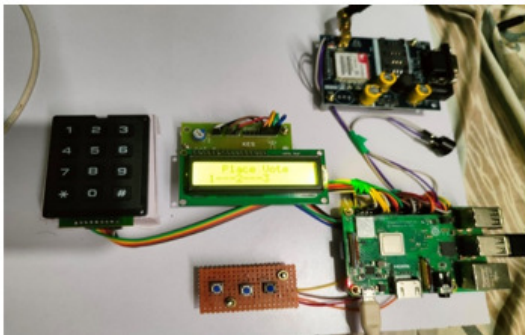


FIG: PLACE THE VOTE

After successful verification of voter Aadhaar number the display shows "place your vote" as

shown in fig 5.5. Then voters cast their vote through the switch button of their choices.

### VI. CONCLUSION & FUTURE SCOPE

The "2 Level Effective Security Voting System" has been successfully developed and implemented, utilizing embedded system technology to enhance the security and integrity of the voting process through dual authentication involving facial recognition and Aadhaar verification. This system has been rigorously tested, yielding accurate results and proving its effectiveness in real-time voting scenarios by authenticating eligible voters and preventing duplicate voting. It overcomes the limitations of traditional voting machines by ensuring each vote is legitimate, thereby drastically reducing the possibility of invalid votes. The design is both simple and cost-effective, making voting easier and more secure. Looking ahead, the integration of advanced facial recognition and Aadhaar authentication technologies holds immense potential to further streamline and secure the voting process, making it more accessible and efficient for voters. As these technologies evolve, they promise to significantly enhance the democratic process by ensuring a single, verified vote per voter, thereby increasing overall election security.

### VII. REFERENCES

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