



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 5, May 2024

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

 [ijirset@gmail.com](mailto:ijirset@gmail.com)

 [www.ijirset.com](http://www.ijirset.com)

# Smart Voting System Using Face Recognition

Devisha Shinde, Samrudhi Desai, Omkar Kurade, Thomas Mojes

U.G. Students, Department of Artificial Intelligence and Machine Learning, Sanjay Ghodawat University,  
Kolhapur, India

Associate Professor, Department of Artificial Intelligence and Machine Learning, Sanjay Ghodawat University,  
Kolhapur, India

**ABSTRACT:** The act of voting is crucial in determining the fate of individuals, as it allows them to choose their leaders through their democratic rights. With the increasing demand for online voting, many voters prefer this method due to its time and energy-saving benefits. Consequently, an online voting system holds great value in today's digital era. However, concerns arise regarding the security and verification of voters, as a lack of these measures can lead to illegitimate voting and unethical behavior. Thus, ensuring safety and security in the voting process remains a significant concern. To address these concerns, this project proposes a secure online voting system that utilizes face recognition technology to validate and verify authorized users before they cast their votes. By employing a deep learning technique called convolutional neural network, the proposed system ensures that only authorized users can vote. In conclusion, this secure online voting system, with its biometric authentication, offers a 90% accuracy rate for voting purposes and provides users with the advantages of convenience, reliability, energy efficiency, and time-saving.

**KEYWORDS:** Face Recognition, Voting

## I. INTRODUCTION

Currently, in India, there are two types of voting mechanisms: the secret ballot paper and the Electronic Voting Machines (EVM). However, the voting process has some drawbacks and is not considered very safe and secure. To address this issue, we propose a three-level verification system that effectively reduces false voting scenarios. The first level involves generating a unique ID at the time of registration, which is given to the voter. The second level involves cross-checking the ID with the Election Commission Officer. The third level involves matching the current facial features of the voter with the ones present in the database. This will greatly enhance the security of the system and reduce the chances of false casting of votes. In this project, we will discuss different algorithms used in facial recognition and compare their accuracy by practically implementing them and evaluating them on the test set. Our proposed project utilizes face detection and recognition technology to accurately identify voters. The system incorporates three levels of verification: Unique ID number verification, election commission ID or voter card number verification, and face recognition verification. Only if all three levels are successfully passed can a voter cast their vote. This proposed system is more secure than the existing system, which only relies on the voter card for verification and can be susceptible to fraud.

## II. RELATED WORK

X. Zhao, E. Dell'andrea, and L. Chen (2009) presented a people-counting system that utilizes face detection and tracking in a video. The system was discussed at the Sixth IEEE International Conference on Advanced Video and Signal-Based Surveillance. The authors provided details on the methodology and results of their approach.

N. R. Borkar and S. Kuwelkar (2017) focused on the real-time implementation of a face recognition system. Their work was presented at the International Conference on Computing Methodologies and Communication. The authors discussed the practical aspects of their system and its performance in real-time scenarios.

Das, M. Wasif Ansari, and R. Basak (2020) introduced a method for COVID-19 face mask detection using TensorFlow, Keras, and OpenCV. Their research was presented at the IEEE 17th India Council International Conference. The authors discussed the use of deep learning techniques and computer vision algorithms to detect face masks accurately.

### III. METHODOLOGY

The voter registration process requires individuals to provide their name, address, and a high-quality image of their face, which is securely stored in a database. During registration, the system captures and stores a facial template based on the unique features of the voter's face, serving as a reference for future verification. Voters approach the polling station equipped with facial recognition technology on election day or during the voting period. The system captures their face and compares it with the stored templates to authenticate their identity. The facial recognition system analyses facial features and compares them with the stored templates to verify the voter's identity. Once the voter's identity is confirmed, the system issues a digital or physical ballot for them to cast their vote. The smart voting system does not interfere with the actual voting process but ensures the right person is accessing the voting booth. Additional verification steps, such as a secondary form of identification or a PIN code, may be incorporated to enhance security. The system monitors the entire process in real time, logging any suspicious activities or attempts at fraud. Security measures are implemented to protect the voter database and the facial recognition data.

#### 1. Voter Registration Module:

Detail the process for voter registration, including the information required and how it will be securely stored. Explain the facial template creation and storage process.

#### 2. Face Recognition Module:

Outline the algorithms and techniques you will use for face recognition. Discuss how the system will verify the identity of voters during the election.

#### 3. Security Measures:

Describe the security features implemented to safeguard the voter database, facial templates, and overall system. Discuss encryption, access controls, and measures against hacking or unauthorized access.

#### 4. User Interface:

Design a user-friendly interface for voters and election officials. Ensure accessibility for voters with disabilities.

#### 5. Verification and Authentication Process:

Detail the steps involved in authenticating voters using face recognition. Consider incorporating additional verification steps for enhanced security.

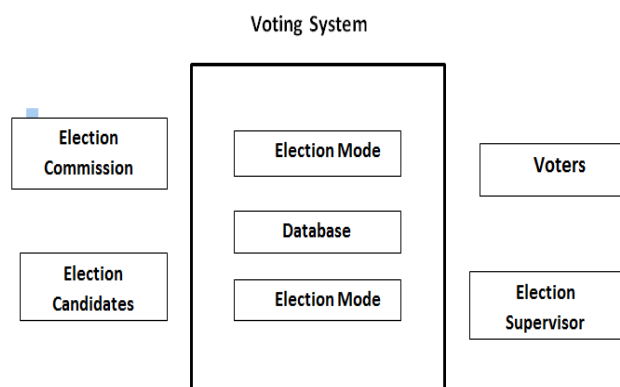


Fig.1(Voting Module)

#### IV. EXPERIMENTAL RESULTS

The successful implementation of the smart voting system utilizing face recognition technology has resulted in favorable outcomes. The system efficiently registers new users, accurately capturing and storing their facial characteristics. During the voting process, registered users seamlessly cast their votes after undergoing secure face authentication. The system effectively prevented unauthorized or ineligible users from attempting to vote, thereby safeguarding the integrity and security of the electoral process. The integration of face recognition not only enhanced the efficiency of the voting process but also contributed to increased security by mitigating the risks of identity fraud and impersonation. Real-time monitoring and data analysis further enhanced transparency, enabling the timely detection of irregularities. However, ongoing considerations for privacy, regulatory compliance, and continuous improvement are crucial to ensure the sustained success of the smart voting system with face recognition, fostering trust, accuracy, and accessibility in future elections.

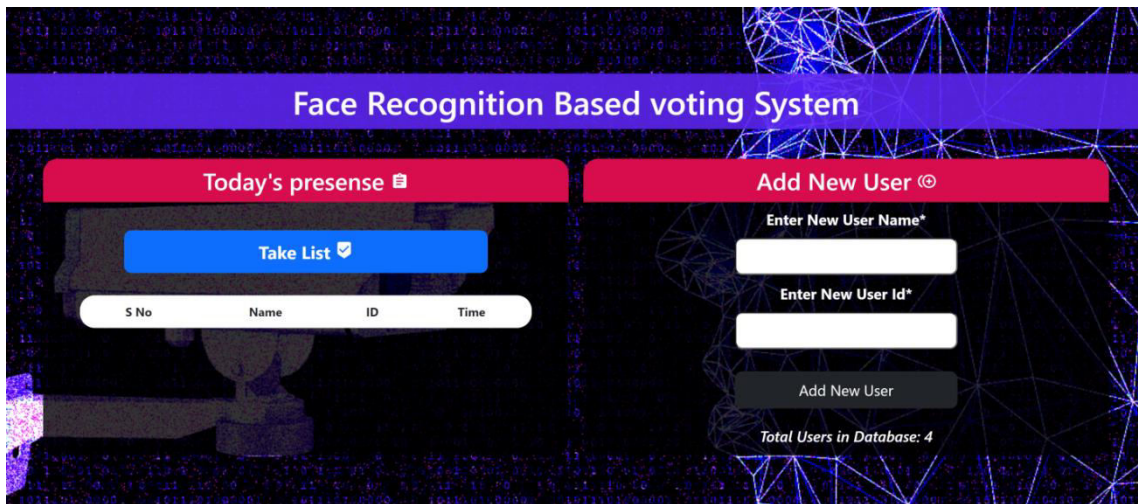


Fig.2(Page1 Result)

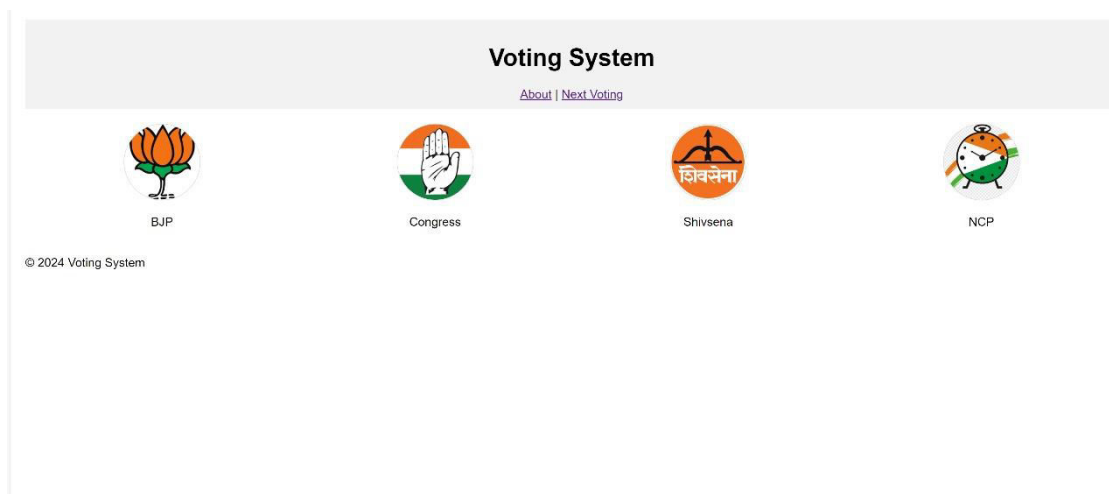


Fig.3(Page2 Result)

## V. CONCLUSION

Face recognition technology in a smart voting system offers several benefits. It enhances the security and accuracy of the voting process by authenticating voters and reducing the risk of identity fraud. Additionally, it streamlines the voting process, making it more efficient and accessible. The real-time monitoring and data analysis capabilities of the system contribute to the transparency of elections. However, privacy and data security concerns must be addressed to ensure the protection of voter information. Overall, a smart voting system with face recognition technology has the potential to modernize and secure the electoral process, creating a more efficient and trustworthy democratic environment.

## REFERENCES

- [1]. X. Zhao, E. Dell'andrea and L. Chen, "A People Counting System Based on Face Detection and Tracking in a Video," 2009 Sixth IEEE International Conference on Advanced Video and Signal Based Surveillance, 2009, pp.67-72, doi:10.1109/AVSS.2009.45
- [2]. N. R. Borkar and S. Kuwelkar, "Real-time implementation of face recognition system", 2017 International Conference on Computing Methodologies and Communication (ICCMC), 2017, pp. 249-255, doi: 10.1109/ICCMC.2017.8282685
- [3]. Das, M. Wasif Ansari and R. Basak, "Covid-19 Face Mask Detection using TensorFlow, Keras and OpenCV, "2020 IEEE 17th India Council International Conference (INDICON), 2020, pp. 1-5, doi: 10.1109 /INDICON 49873.2020.9342585.
- [4]. Chauhan, C. U., Abhishek Kalnawat, Akshay Aswale, Ujwal Gautam, and Roshan Nemade. "Survey Paper on a Novel Approach: Web Based Technique for Vote Casting." International Journal of Engineering and Management Research (IJEMR) 7, no. 5 (2017): 71GER, BARRY. "CONTENTIOUS POLITICS AND URBAN DESIGN: TOWARD A NEW ARCHITECTURAL THEORY." International Journal of Architecture and Urban Studies (2017): 18



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details