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Online Voting System Using Facial Recognition

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Abstract: This project focuses on providing a Multi-layered online voting system. With various verification checks, it aims to improve the voting system. First, the voter's ID must be verified, then the voter must be authenticated by providing an OTP to the registered mobile number. The next step is to photograph and authenticate the face. As voting time begins, live proctoring of the voters is enabled, and it is active until the voter casts their ballot.

IndexTerms **- Online Voting System, Webpage, Multi-layered authentication, OTP Verification, Face Authentication, Live Proctoring**

I. INTRODUCTION

An online voting system is a digital platform that enables eligible voters to cast their ballots electronically over the internet. Online voting systems have drawn a lot of interest recently as a potential replacement for traditional paper-based voting systems, which can be difficult, expensive, and time-consuming to manage. A number of advantages, such as improved accessibility, convenience, and efficiency, can be achieved by using online voting systems. Online voting systems can enable voters to cast their ballots from anywhere with an internet connection, reducing the need for physical polling stations and potentially increasing voter turnout. Online voting systems can also speed up the voting process by requiring less time and resources to tally and tabulate votes, as well as minimizing mistakes and inconsistencies that may occur.

However, the use of online voting systems also raises a number of challenges that must be carefully managed to ensure the integrity and security of the voting process. Technical problems including system hiccups, failures, and malfunctions as well as cybersecurity threats like hacking, data breaches, and result manipulation are examples of potential risks. Therefore, careful consideration of the technical, social, and political aspects of the voting process is required in the development and implementation of online voting systems. This includes the design of secure and reliable systems, the development of appropriate regulatory frameworks, and the establishment of trust and confidence among voters in the integrity of the system.

This paper aims to explore the potential benefits and challenges of online voting systems and to identify best practices and guidelines for the development and implementation of secure and reliable online voting systems. In order to shed light on the technical, social, and political aspects of using online voting systems, the paper will reference prior research as well as case studies. It will also make suggestions for further study and advancement in this area.

II. EXISTING SYSTEM

Elections, in which voters have the opportunity to voice their opinions and express their preferences, are the defining feature of all democratic administrations. Voting procedures have advanced significantly throughout the years, moving from simple handwritten ballots to online voting platforms. Before every election, voter lists are manually checked. Election day voters cast their ballots at the correct polling location. Before using an electronic voting machine, manual validation is done there.

Voters must first be verified as legitimate before casting a ballot. A legitimate government-issued ID must be shown, a register must be signed, or a biometric authentication technology must be used. Voters are given access to an electronic voting machine (EVM) after being verified. The candidate or party of the voter's choice is marked on the electronic voting machine by pressing a button. The votes are tallied to choose the winner when the voting session has ended. The votes are automatically recorded and counted electronically in the case of an EVM. The results are made public when the votes have been tallied.

III. PROPOSED SYSTEM

You may conveniently and safely manage your elections with the aid of the online voting system, which is a web-based voting system. During the nationwide elections that are held, voters can use this voting system to cast their ballots. With this system, the

voter can cast their ballot without going to the polls. They are able to vote online using a personal computer. To hold all the necessary voter information, a database is kept up to date.

It contains two separate logins, one for the administrator and one for the voter. We may review all voting results in the admin login and we can also check the voting results by zone, city, and state. In order to register voters, the system administrator just fills out a registration form to register the candidate. Voters can cast their ballots after logging in, but they must first get around three-step authentication.

First, they must confirm their voter identification. Once their voter identification has been verified, they will receive a six-digit One-Time Password (OTP), which is sent to the mobile number associated with their voter identification and is only valid for 30 seconds. Once the user's OTP has been verified, they must verify their face before entering a live proctoring session where they can cast their vote. The session lasts for five minutes. Online voting has the benefit of giving voters the freedom to vote whenever it is convenient for them, which reduces traffic and helps to increase the number of votes cast. Additionally, it lessens the number of phone votes and counting errors.

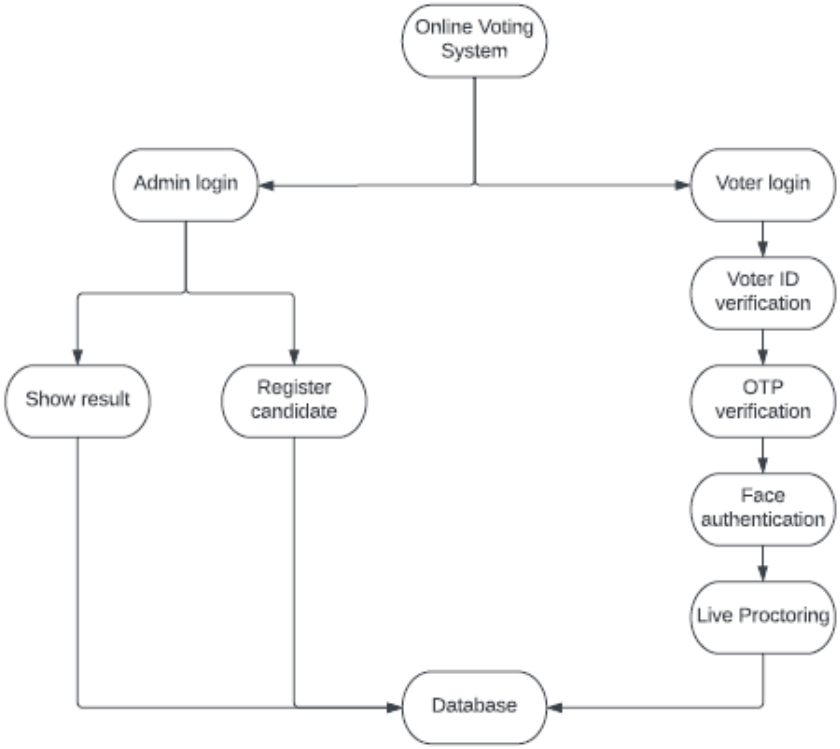


Figure 1 Flow Diagram

IV. METHODOLOGY

1. TIME BASED ONE TIME PASSWORD (TOTP)

TOTP stands for Time-Based One-Time Password algorithm. It is a type of two-factor authentication system that is widely used to secure online accounts. Firstly, the user must set up two-factor authentication for their online account using a TOTP app such as Twilio. When the user logs in, the server generates a secret key and shares it with the TOTP app on the user's device. The TOTP app uses the secret key and the current time to generate a one-time password. The one-time password is then sent to the server along with the user's login credentials. The server checks the one-time password to ensure that it matches the one generated by the TOTP app. If the one-time password is valid, the user is granted access to their account. The secret key used by the TOTP app and the server is typically a 16-byte (128-bit) random value, and the one-time passwords generated by the TOTP app are typically six digits long. The TOTP algorithm uses a hash function, typically SHA-1 or SHA-256, to hash the secret key and the current time into a 20-byte (160-bit) or 32-byte (256-bit) value. The one-time password is then generated by taking a subset of the hashed value and applying a modulo operation to restrict the output to the desired number of digits. The time-based aspect of the TOTP algorithm is based on a time step, typically 30 seconds, which determines the interval at which the one-time password is regenerated. The TOTP app and the server both use the same time step to ensure that the one-time password generated by the app is in sync with the one expected by the server. Overall, the TOTP algorithm provides a secure and reliable method of two-factor authentication that can protect online accounts from unauthorized access.

2. FACE AUTHENTICATION

Face authentication is a process by which an individual's identity can be verified by scanning their face.It is a sort of biometric authentication that compares a person's face to their identity using facial recognition technology. In contrast to facial recognition, which identifies a person based on their facial features, facial authentication confirms that the person is who they say they are. Face recognition can be used to unlock gadgets, enter restricted areas, and process payments, among other things. It is regarded as a reliable way of authentication that protects privacy while balancing convenience and security. It is also a very secure method of authentication because it is challenging to mimic or spoof a person's distinctive face features. Facial hair, lighting, and facial

emotions are just a few examples of environmental elements that might cause false positives or false negatives in face identification systems.

3. LIVE PROCTORING

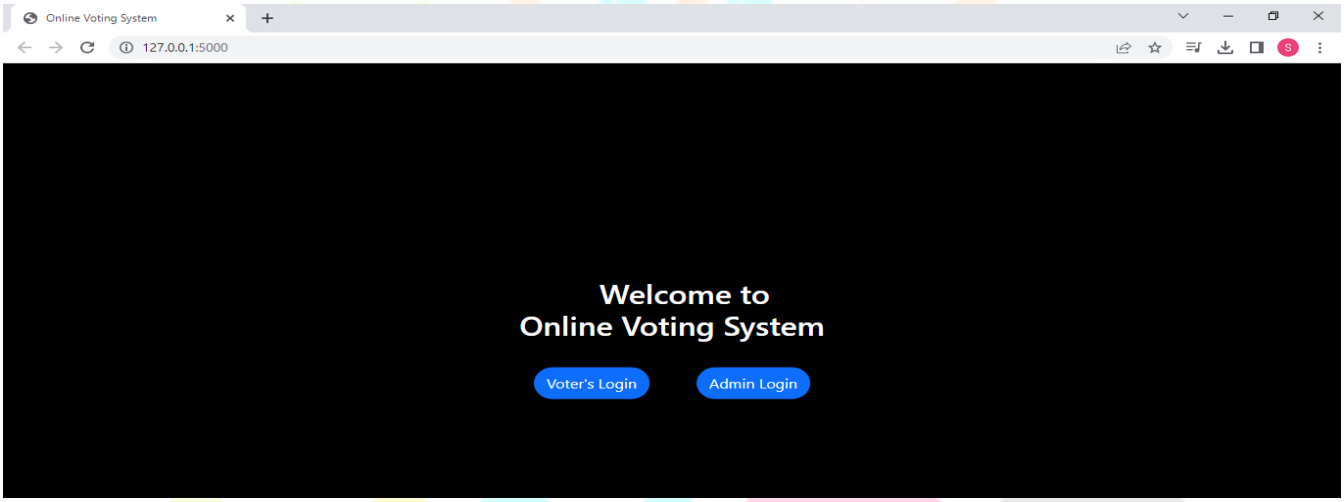
Live proctoring is a technology-driven process that involves a human proctor monitoring test-takers in real-time during an exam. The proctor monitors the candidate through a live video feed and audio to ensure that they are not engaging in any prohibited behavior, such as cheating, using unauthorized resources, or communicating with others. The live proctoring system uses artificial intelligence (AI) and machine learning (ML) algorithms to detect prohibited behavior. This could include detecting multiple faces in the video feed, background noise, or abnormal eye movements. If prohibited behavior is detected, the proctor may intervene by issuing a warning, suspending the session, or disqualifying the candidate. Live proctoring helps to ensure the integrity of online exams and assessments by detecting and preventing cheating and other forms of misconduct. It is often used in online education, professional certification, and high-stakes exams.

V. CONCLUSION

An online voting system is a type of voting system that allows voters to cast their ballots over the internet instead of physically going to a polling booth. It is designed to provide a convenient, efficient, and secure way for voters to participate in the democratic process. Online voting systems can vary in design and implementation, but they typically include measures to ensure the security, accuracy, and anonymity of the voting process. Online voting systems have the potential to increase voter participation and reduce costs associated with traditional paper-based voting systems. However, they also face several challenges, including concerns about security, privacy, and accessibility. As such, it is important to carefully design and implement online voting systems to ensure that they are reliable, secure, and accessible to all eligible voters.

VI. RESULT

Homepage



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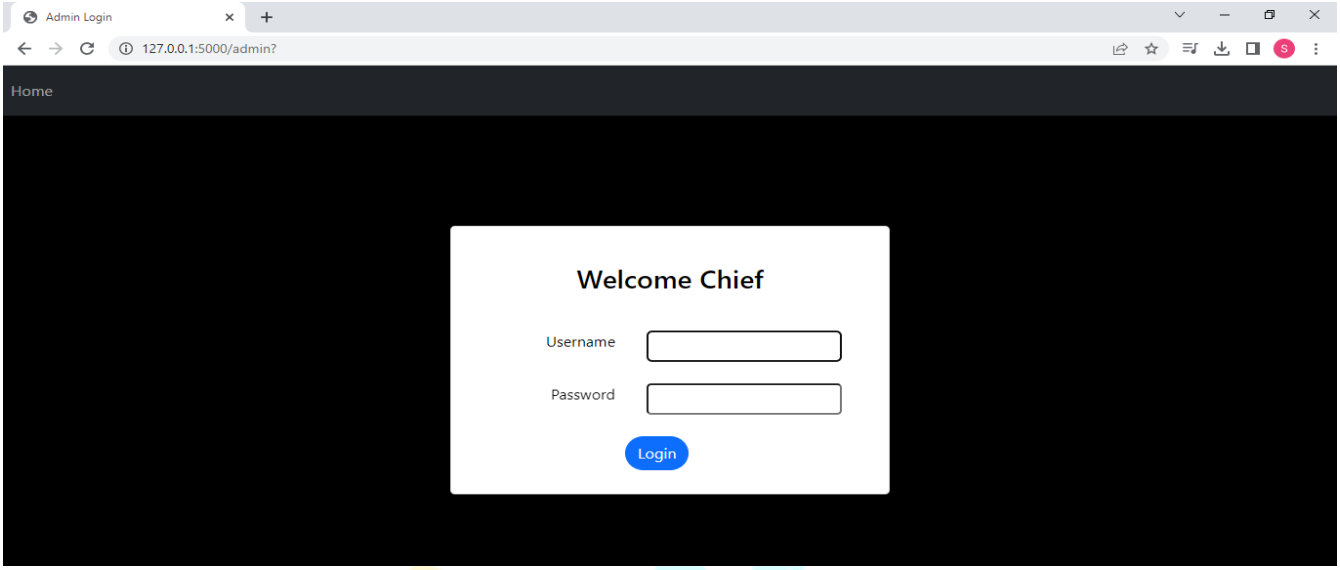
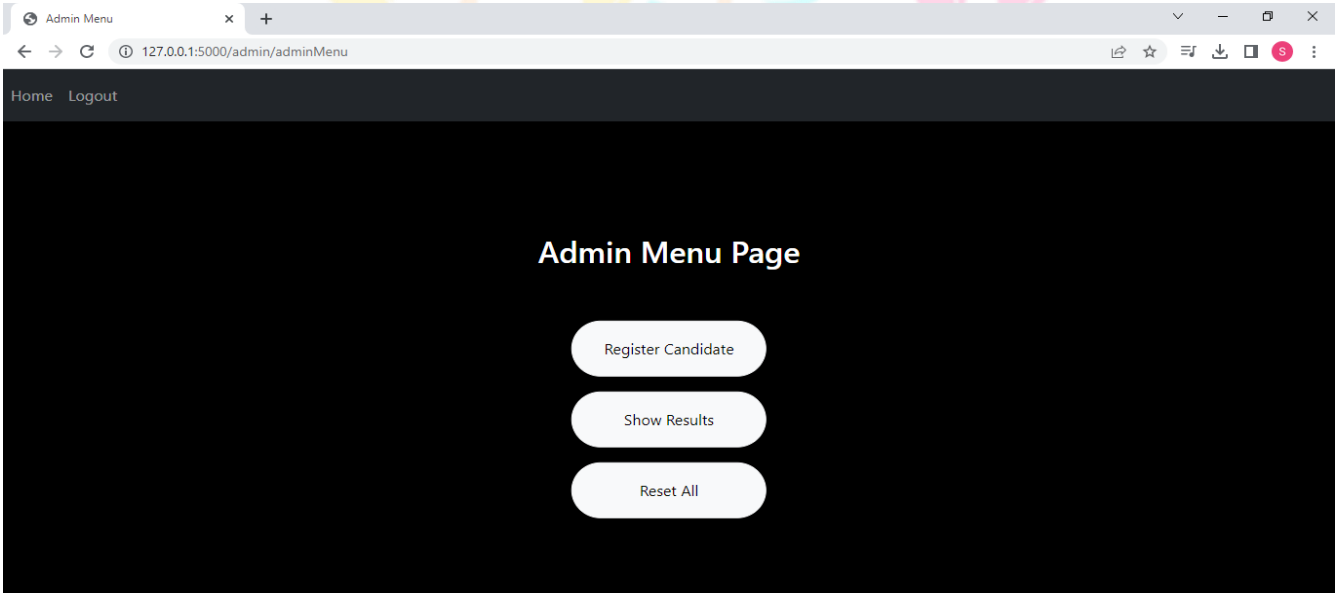
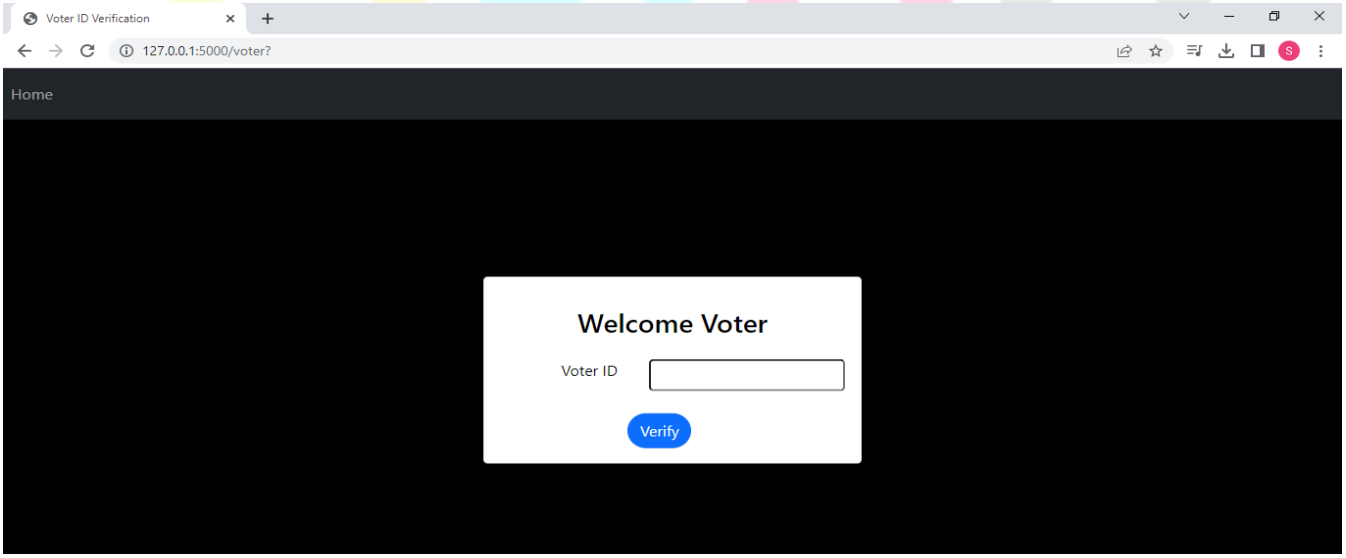
Admin Login



Admin Menu



Voter Login



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