

Online Voting System using Face Recognition and Blockchain

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Abstract: *Electronic voting (also known as electronic voting) refers to the use of electronic means to vote and to record and accurately count votes sent by users. Electronic voting systems must be secure, as they must not allow duplicate votes and be completely transparent, while protecting the privacy of participants. The disadvantage of the traditional voting system is that voting is not reliable and voters do not change until they are registered in the system. There is no transparency between the voters and the system. Electronic voting can be very useful because anyone can easily access the poll and cast their vote and express their choice. People can share a private link to the created poll (as long as they know the link) and the person with the link can vote and only one vote can be used per browser. In this proposed system, we design and develop a web-based application using python and flask framework for an online voting system using Face Recognition and Blockchain Technology with a decentralized data storage system.*

Keywords: Blockchain Technology with Decentralised System, Electronic Voting System, Candidates, Voters, Face-Recognition, etc.

I. INTRODUCTION

Voting is a way of making a collective decision or expressing an opinion among a group or assembly or electorate. Polls usually follow debates, debates and election campaigns. In polling, the person who is to be elected is the election candidate and the person who casts his vote for the elected candidate is the voter. Generally, a voter can vote according to a list of candidates or vote for other persons whom they prefer. Ballots must be unsigned by voters in private booths and marked in such a way that no one else can know who the citizen is voting for. Since the 17th century, voting has been the common mechanism by which modern representative democracy has operated. Polling is also used in many other private organizations and groups such as clubs, corporations and voluntary associations.

With the rapid development of Internet and information technology, many traditional offline services such as voting, mail, payments are shifting to online services. Online voting is known as electronic voting (e-voting). It is an electronic means of voting and counting. Users of electronic voting are voters and election authorities. Voters can electronically submit their votes to election officials from any location through electronic voting. Election officials are responsible for collecting votes from voters. Electronic voting can save time and effort with high efficiency and flexibility, which is gaining more and more attention as an alternative to traditional voting. With the growth of the Internet, electronic voting has become an important tool for many organizations. Company Kiayias et al proposed an efficient E2E verifiable e-voting system with no set-up assumptions. Suggested unauthenticated, or verified encryption and its application in electronic voting systems.

II. LITERATURE REVIEW

- Gupta A, Patel J, Gupta M, Gupta H, "Issues and Effectiveness of Blockchain Technology on Digital Voting." The system presented in Blockchain Technology Issues and Effectiveness on Digital Voting Blockchain is a technology that enables the movement of digital coins or assets from one person to another. The blockchain concept can be understood with the concept of a linked list in a data structure, because its next key address is stored in the previous key and they are connected to each other. Methodology: It was first conceived in 2008 that was implemented in successive years as a core component of the digital currency Bitcoin, which acts as a

public ledger of all transactions. Digital voting through blockchain technology has some issues and effectiveness but our concern is to focus on how effective the system makes this technique. Here, our main focus is how the system can apply this technology in our daily life. Our country India is keenly interested in future use and many efforts are being made to overcome the security issues as soon as possible.

- New. A., Rupini R., Sai Niranjana A.S. etc. Al, "Electronic Voting Machine Based on Blockchain Technology and Aadhaar Verification." A system presented in electronic voting machines based on blockchain technology and Aadhaar verification, that a nation with a low voting percentage will struggle to develop as it is necessary to elect a suitable leader for the nation. Very necessary. Our proposed system is designed to provide secure data and reliable elections to the people of a democracy. As Aadhaar card is most essential for identification of an individual, it is highly recommended to organize the election process using it. Blockchain will be publicly verifiable and distributed in such a way that no one can corrupt it. Methodology: The proposed system is mainly based on Aadhaar verification for our country where the details of persons above 18 years are extracted from Aadhaar card database as it has become mandatory in present scenario. To ensure greater security, the voter's fingerprint is used as the main authentication resource. The system will allow the voter to vote through his finger print. As soon as they cast their vote, blockchain technology comes into existence which is integrated inside the EVM. Blockchain adoption in database distribution can reduce one fraudulent source of database manipulation. This research discusses the recording of voting results in a blockchain algorithm from each polling station.
- Hardwick, Freya Sheer, Raja Naeem Akram, and Konstantinos Markantonakis, "Voting with Blockchain: An E-Voting Protocol with Decentralization and Voter Privacy". E-Voting with Blockchain: An E-Voting Protocol with Decentralization and Voter Privacy that a potential solution to the lack of interest in voting amongst the young tech population. For e-voting to become more open, transparent, and independently auditable, a potential solution would be base it on blockchain technology. This paper explores the potential of the blockchain technology and its usefulness in the e-voting scheme. An e-voting scheme, which is then implemented.

III. PROPOSED SYSTEM

3.1 Design Considerations

- High Accuracy & great performance.
- Proposed System uses different algorithms to increase accuracy rate.
- It is user friendly application.
- Easy to use.
- Time saving.
- Security
- Authentication
- Accuracy to find out the eligible person.
- The easy to vote.
- Time efficient process
- Avoid the fraud.

3.2 Description of the Proposed Algorithm

A. Convolutional Neural Network (CNN)

CNN is one of the main categories to do image recognition, image classification. Object detection, face recognition, emotion recognition etc., are some of the areas where CNN are widely used. CNN image classification takes an input image, process it and classify it under certain categories (happy, sad, angry, fear, neutral, disgust). CNN is a neural network that has one or more convolutional layers.

Step 1: Dataset containing images along with reference emotions is fed into the System. The name of dataset is Face Emotion Recognition (FER) which is an open – source data set that was made publicly available on a Kaggle.

Step 2: Now import the required libraries and build the model.

Step 3: The convolutional neural network is used which extracts image features f pixel by pixel.

Step 4: Matrix factorization is performed on the extracted pixels. The matrix is of $m \times n$.

Step 5: Max pooling is performed on this matrix where maximum value is selected and again fixed into matrix.

Step 6: Normalization is performed where the every negative value is converted to zero.

Step 7: To convert values to zero rectified linear units are used where each value is filtered and negative value is set to zero.

Step 8: The hidden layers take the input values from the visible layers and assign the weights after calculating maximum probability.

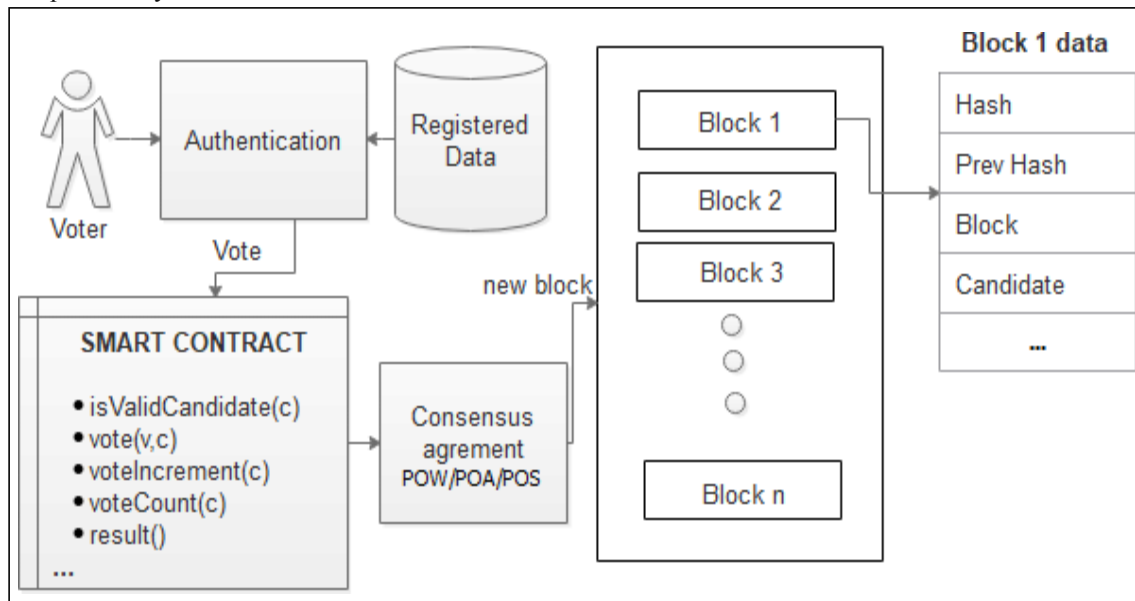


Fig.1: System Architecture

The proposed system highlights the implementation of e-voting using blockchain for such a proposal from a practical point of view both in the development/deployment and usage contexts. Accomplishing this task is a potential roadmap for blockchain technology to be able to support complex applications. Creating an electronic voting system that meets the legislative needs of legislators has long been a challenge. Distributed ledger technology is an exciting technological advancement in the information technology world. Blockchain technologies offer an endless array of applications that benefit from sharing economies. The purpose of this paper is to evaluate the application of blockchain as a service to implement a distributed electronic voting system.

IV. CONCLUSION AND FUTURE SCOPE

Due to the complexity of this domain and the need for more robust and effective information technology systems, there are many research directions for applying blockchain technology to the polling industry. An interoperable architecture will undoubtedly play a significant role in many polling use cases that face similar data sharing and communication challenges. From a more technical perspective, further research is needed to determine the most practical design process for creating an interoperable ecosystem using blockchain technology while balancing critical security and privacy concerns in healthcare. Whether creating a decentralized application that leverages existing blockchains, additional research on secure and efficient software practices for applying blockchain technology to voting is also needed to educate software engineers and domain experts on the potential and limitations of this new technology. Likewise, validation and testing approaches are also important to measure the effectiveness of blockchain-based voting architectures compared to existing systems (e.g., through performance metrics related to time and computational cost or through assessment metrics related to its feasibility). In some cases, a new blockchain network may be more suitable than an existing blockchain; Therefore, another direction could be investigating extensions of existing blockchains or creating voting blockchains that only provide health-related services.

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