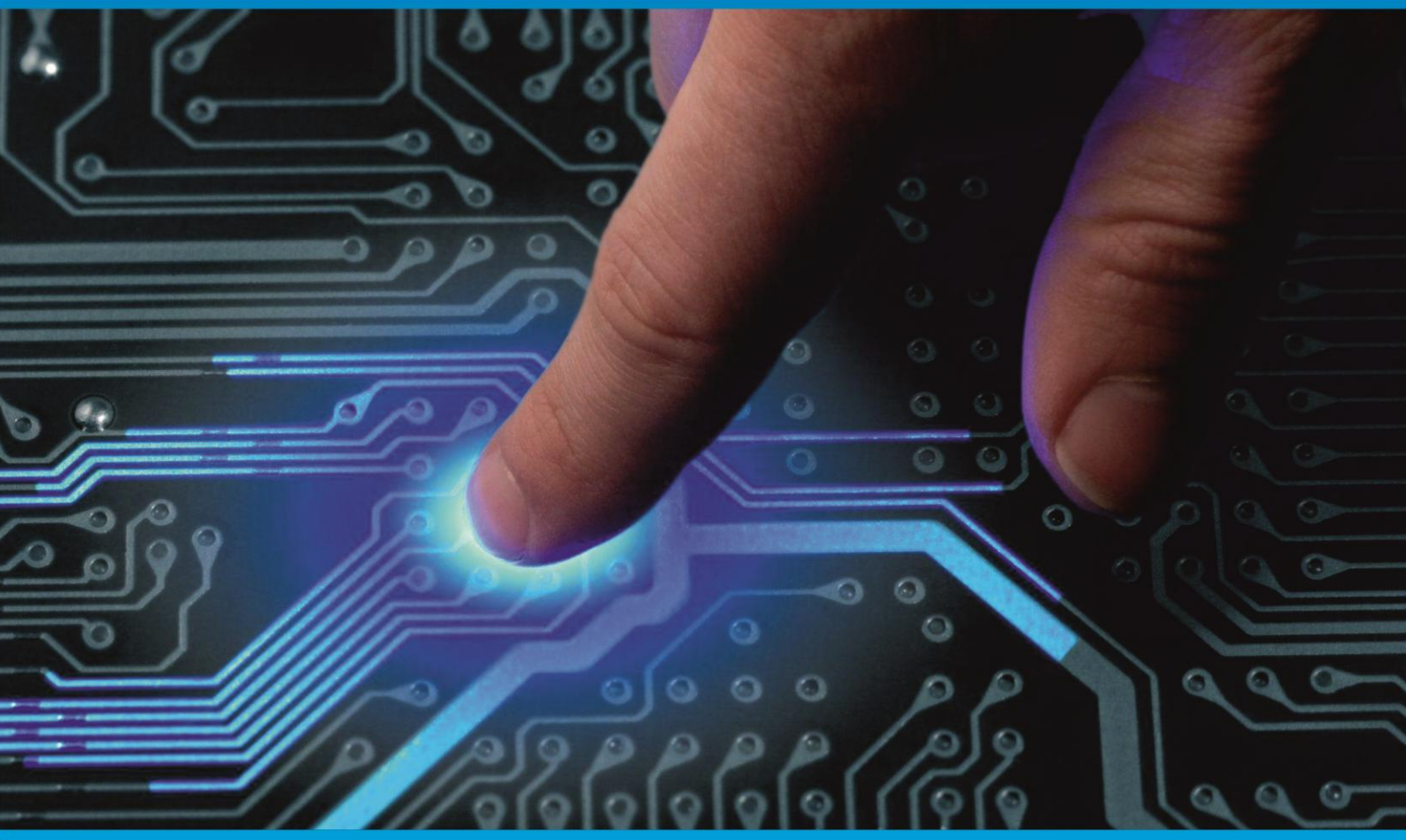
IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 8, Issue 10, October 2020

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.488

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 7.488 |

|| Volume 8, Issue 10, October 2020 ||

Centralized Voting System using Facial Detection Recognition and One-time Password

Rohan Shrikant Nikam[1], Hasib Sheikh[2]

Final Year Student, Dept. of Computer Engineering, KC College of Engineering, Thane, India[1]

Assistant Professor, Dept. of Computer Engineering, KC College of Engineering, Thane, India[2]

ABSTRACT: Elections are fundamental pillar of a democratic system enabling the general public to express their views in the form of a vote. The voting process should be transparent and reliable so as to ensure participants of its credibility. In such a system ease of use, reliability and security is important. Nowadays tradition paper ballot systems are being replaced by advanced biometric voting system.

This project is built around face id and personal data. Registered voters are identified by system by means of their earlier data and can vote. This system can handle high influx of voters. It can scan and allow voters in mass to vote and verify their option. Since such system is centralized all data is secure and results can be declared quickly.

KEYWORDS: Face Detection and Recognition,OTP.

I.INTRODUCTION

India is an egalitarian country. Indian government is of the people, for the people and by the people. The most important feature of a democracy is that the people must have the right by citizenship to choose the leader for their country, stateand local area. Thus, election in voting is an important aspect. With the evolution of technology, various voting techniques have been implemented such as ballot machines, EVMs, Kiosks and so on.

However, currently many E-voting systems have also been introduced namely punch scan, optical scan, specialized voting Kiosks and so on. Online voting using internet is one of the methods that have emerged.

With the advent of technology, mobile phones with programmable platforms have emerged. Also, latest technologies such as biometrics (thumb scans, iris scans and face recognition) can be used to assure security for the voter authentication. Using some of the above-mentioned techniques and technologies, an effort has been made to develop an E-voting system for a modern individual.

The two authentication techniques are Face Detection and Recognition and One Time Password (OTP). In Face Detection and Recognition, the voter's image is captured and passed to a face detection algorithm which is used to authenticate his face from the image and save it as the first matching point. In One Time Password principle produces pseudorandom password each time the user tries to log on. This OTP will be sentto voter's mobile phone. An OTP is a password that is only valid for single login session thus improving the security. Voters must just scan their face at the terminal provide OTP and can vote. A bulk of voters can vote and leave very fast. Once the last vote is cast, counting can be initialized in the system. The result can be declared in short time on the system.

II.METHODOLOGY

In user side,if the user is first time using this application then they need to register and fill the required information asked by this application. After successfully registration user can use this application.When it's time to vote, user can get access from the admin. User can receive OTP for verification. After that user can cast their vote.

In admin side, admin can accept user registration. After that admin can scan user face and give access to the user.In Face Detection and Recognition, the voter's image is captured and passed to a face detection algorithm which is used to detect user face from the image and save it as the first matching point. Admin can provide OTP for verification to the user. After that user can cast vote. Admin needs to add security question for each user and verify them.An OTP is a password that is

only valid for single login session thus improving the security. Admin can add security question for verifying particular users.

Front End:

Tkinter: The user interactable end of the application is designed using Tkinter. It is a Python binding to the Tk GUI toolkit. It is the standard Python interface to the Tk GUI toolkit, andit is Python's de facto standard GUI. Tkinter is included with standard Linux, Microsoft Windows, and Mac OS X installs of Python.

Back End:

Haar Cascade: Haar-like features are digital image features used in object recognition. They owe their name to their intuitive similarity with Haar wavelets and were used in the first real-time face detector.

Historically, working with only image intensities made the task of feature calculation computationally expensive. A publication by Papageorgiou et al. discussed working with an alternate feature set based on Haar wavelets instead of the usual image intensities. Paul Viola and Michael Jones adapted the idea of using Haar wavelets and developed the so-called Haar-like features. A Haar-like feature considers adjacent rectangular regions at a specific location in a detection window, sums up the pixel intensities in each region and calculates the difference between these sums. This difference is then used to categorize subsections of an image. For example, with a human face, it is a common observation that among all faces the region of the eyes is darker than the region of the cheeks. Therefore, a common Haar feature for face detection is a set of two adjacent rectangles that lie above the eye and the cheek region. The position of these rectangles is defined relative to a detection window that acts like a bounding box to the target object (the face in this case).

In the detection phase of the Viola–Jones object detection framework, a window of the target size is moved over the input image, and for each subsection of the image the Haar-like feature is calculated. This difference is then compared to a learned threshold that separates non-objects from objects. Because such a Haar-like feature is only a weak learner or classifier a large number of Haar-like features are necessary to describe an object with sufficient accuracy. In the Viola–Jones object detection framework, the Haar-like features are therefore organized in something called a classifier cascade to form a strong learner or classifier.

The key advantage of a Haar-like feature over most other features is its calculation speed. Due to the use of integral images, a Haar-like feature of any size can be calculated in constant time (approximately 60 microprocessor instructions for a 2-rectangle feature). RBE = IBE – TEnode

OpenCV: OpenCV is a library of programming functions mainly aimed at real-time computer vision.Originally developed by Intel, it was later supported by Willow Garage then Itseez.The library is cross-platform and free for use under the open-source Apache 2 License. Starting with 2011, OpenCV features GPU acceleration for real-time operations.

NumPy: NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.The ancestor of NumPy, Numeric, was originally created by Jim Hugunin with contributions from several other developers. NumPy is open-source software and has many contributors.

Matplotlib: Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK+. There is also a procedural "pylab" interface based on a state machine, designed to closely resemble that of MATLAB, though its use is discouraged. SciPy makes use of Matplotlib.

Scikit-image: Scikit-image is an open-source image processing library for the Python programming language. It includes algorithms for segmentation, geometric transformations, color space manipulation, analysis, filtering, morphology, feature detection, and more. It is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy.

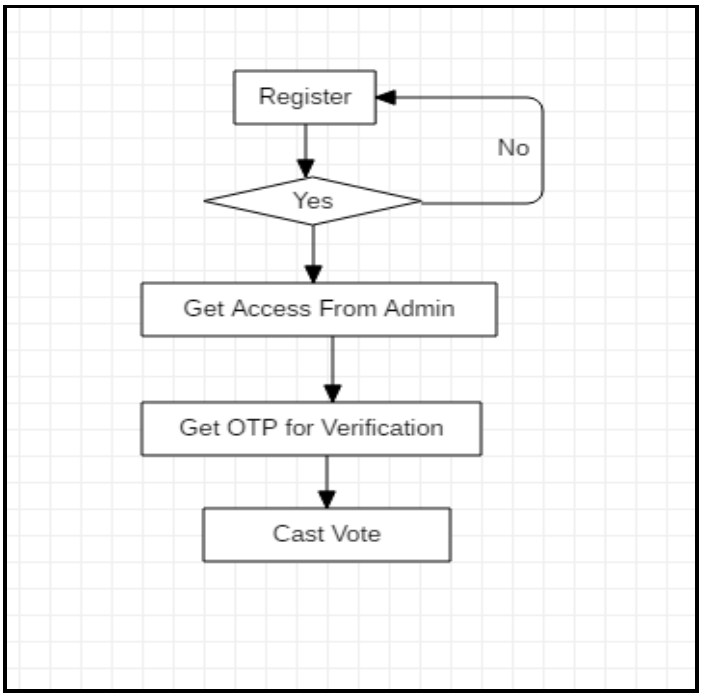


Fig.1.Voter Flow chart

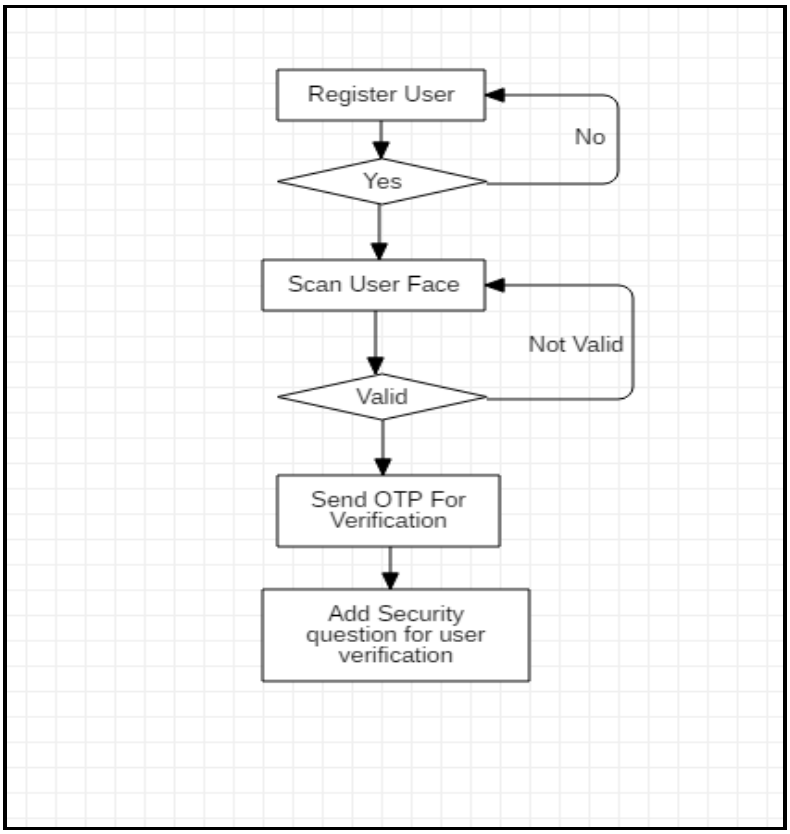


Fig.2.Admin Flow chart

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 7.488 |

|| Volume 8, Issue 10, October 2020 ||

III.PROPOSED SYSTEM

The sanctity of elections must be ensured for mechanisms to ensure faster processing of voters as well as security of the election is secured. For thiswe emphasize on security first approach, here personal data taken for verification is stored safe on centralized systems and processed in pace.
A reliable amount of personal data is taken from a voter and stored. When it is time to vote an admin, controlled system allows the registered voters to verify themselves and then are then led to the ballot.
Registering a new user includes taking their biometric face data, mobile number, personal data (For security questions). Except for face data other personal data can be stored in excel sheets. Message is displayed to confirm the user's choice. The final result is then tallied and displayed.

IV.SCOPE

Centralized voting systems have high degree of security. To register a new voter, the voter must provide with voter information, phone number and face id. All the data is stored securely along with face scans to identify the voter during time of voting. The face data is stored in grey scale as train data set in the system. During time of voting the voter is searched in the database and asked to provide the appropriate information to UI following which the voter can vote. The system can then compute the results and display the outcome of the process.

V.PROBLEM STATEMENT

In traditional voting system there is paper trail of voter data, identity, and voter choice during voting. All this bulk data is time consuming to and insecure to manage. Such flaws in scheme of voting can shake trust in the voting system.
This Centralized voting system can overcome the challenge by providing high level of security and fast computation of results. To register a voter face id and other personal information is taken. This data is stored securely in the system and cannot be tampered with. When the voting is due the voter just needs to scan and identify himself and provide OTP which is taken as personal information during registration. Thus, voters in bulk can vote and leave very fast. This reduces long lines on voting booths. Results can be displayed very quickly due to low processing time. Such system makes it difficult to predict and influence the outcome. A list of security question that are part of documentation of voter can be included that are known to the voter only, this increases the complexity and security of the system.

VI.RESULTS

Fig.3.Voter recognized

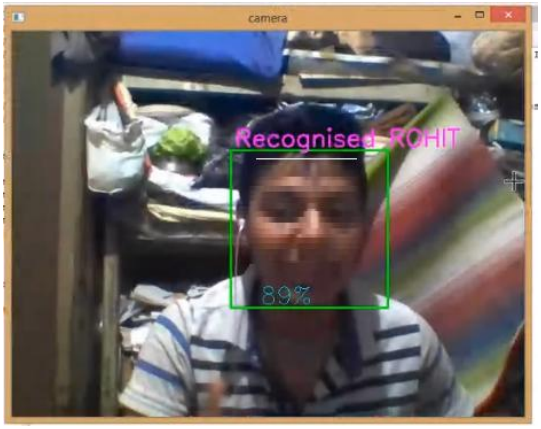


Fig.4.OTP Verification

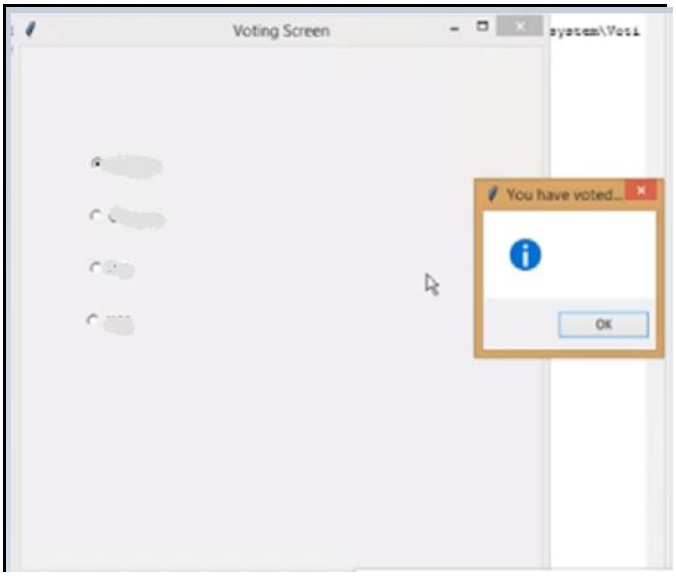


Fig.5.Vote ballot

VII.FUTURE WORK

Future research shall explore sophisticated methods for increasing scalability and register of mass voter base in less time as possible.
The security can be further enhanced by increasing scope of security question and widely available unique personal identification details.

VIII.CONCLUSION

The main advantage of project is simplicity which attracts lot of voting users. This application can easily used by the user. In this project, we have implemented face scan and one-time password which is innovative. Face Detection and Recognition (FDR), and One Time Password (OTP).In Face Detection and Recognition the voter's image is captured and

passed to a face detection algorithm which is used to detect his face from the image and save it as the first matching point. When user tries to log in, One Time Password provide for verify user. This OTP will be sent to voter's mobile phone. Personal security question is added to increase accuracy since FDR isn't fully accurate.

This system saves the time of voters. As the system is centralized and fast processing, queues at the voting stations can be reduced. Voters can see the processing and their option in real time. All though scan reliability can be increased by increasing data set, the available processing can be upscaled by faster hardware and buffer usage. This system is a highly tempting alternative over traditional system. Also, newer technologies can be added in modular approach, increasing reliability and lifespan of the system.

REFERENCES

1. Hari K. Prasad, J. Alex Haldermany, Rop Gonggrijp, Scott Wolchoky, Eric Wustrowy, Arun Kankipati, Sai Krishna.
2. Sakhamuri, Vasavya Yagati, "Security Analysis of India's Electronic Voting Machines", April 29, 2010.
3. Sheifali Gupta, O.P. Sahoo, Ajay Goel, Rupesh Gupta, "A New Optimized Approach to Face Recognition UsingEigenFaces", Global Journal of Computer Science and Technology Vol. 10 Issue 1, April 2010.
4. S. Ravi, S. Wilson, "Face Detection with Facial Features and Gender Classification Based on Support Vector Machine", 2010, Special Issue - International Journal of Imaging Science and Engineering.
5. Hemlata Sahu, Anupam Choudhray, "Polling System Using GSM Facility", International Journal of Scientific & Engineering., Research. Volume 2, Issue 10, Oct-2011.
6. Mr. Mayur Patil, Mr. Vijay Pimplodkar, Ms. Anuja R. Zade, Mr. Vinit Vibhute, Mr. Ratnakar Ghadge, "A Survey on Voting".

INNO SPACE

SJIF Scientific Journal Impact Factor

Impact Factor:
7.488

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details