

A Survey on Biometric Voting System using Iris Recognition

Jayapriya J¹, Roghini M², Jayanthi S

¹UG Student, Department of CSE, Agni College of Technology, Tamil Nadu, India

³Assistant Professor, Dept of Computer Science and Engineering, Agni College of Technology, Tamil Nadu, India

Abstract - In every election, the election commission is facing a lot of troubles and different type of problems throughout the election. The most familiar issue faced by the election commission is inappropriate confirmation with respect to the arrangement of casting the votes, duplication or illegal casting of votes. In this paper, a secure and new voting system is developed to improve the existing voting system using iris recognition. Iris is one of the most secure biometric of person identification. The main goal of this article is to avoid duplication of casting votes.

Key Words: - Iris, Recognition, Data mining, feature extraction algorithms, matching.

1. INTRODUCTION

Voting System is the government election processes in every democratic nation. Democracy is to allow people to vote on their interest and it is right of every individual of a democratic nation. The democratic government depends on the results of the election.

Today's world is an era of internet and technology, internet and electronics are increasing day by day. It is unavoidable to upgrade the traditional voting system and protect the security of it. The main intention of this article is to develop a new idea about voting system and also ensure security of it.

To safeguard the security of voting system, We use iris recognition in proposed system. Iris recognition is used since it is highly unique, stable, cannot be duplicated and easily captured.

Many types of voting system have been used around the world. Paper ballot voting system is an old and unsecure voting system where it is possible to fling multiple votes from same person. It runs to fling the vote with a ballot paper and a stamp.

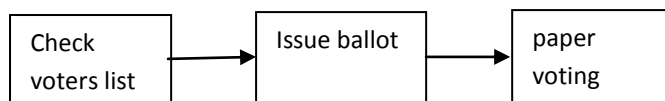


Fig. 1. Traditional voting system

In electronic voting system, the process of election data is recorded, stored and preceded as digital information. Electronic voting system is used to fling vote as well as counting number of votes. Electronic voting system using solar power is shown in fig. 2. The electronic voting system uses AVISPA technique.

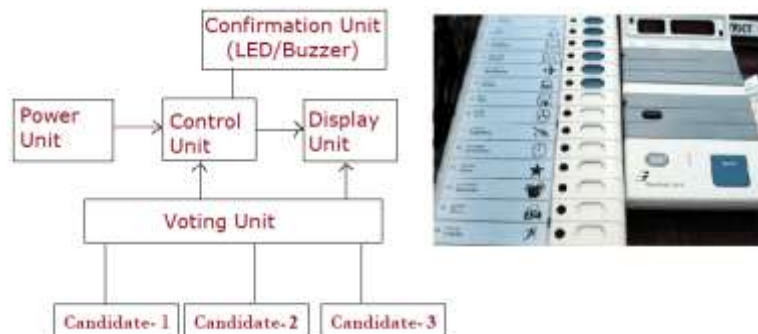


Fig. 2. Electronic voting system

Security is the important aspect of existing voting systems. There is a lot of chances for fake voting. Nowadays some politicians are following illegal method to succeed in the election. The traditional paper ballot and electronic voting systems need more manpower. These existing systems are more time consuming and also slow. In the proposed system we use Iris pattern. Hence proposed system is secure than the existing system

2. RELATED WORK

In this Section we have studied few papers which show that data mining has a strong connection towards the collection of images and data required for the biometric voting system.

A survey of Existing models/Work

1. Anil K. Jain(2019),Michigan State University: This paper tells the science of automatically identifying individuals based on their physiological or behavioral characteristics
2. Emma New ham(2014):Biometric as well as password security to voter is provided using cryptography and stenography. The main purpose of this system is to provide proper authentication of voter for voting system
3. A.Stoney(2001):to fling a vote, a voter has to enter the personal identification number and a secret key and along with this fingerprint is also required on the sensor. The system generates a cover image and embed secret key into it to generate a stego image. Now the stego image is sent to the server, at server side optical recognition character technique is used after reading this, the server will find the individuals from the datasets.
4. Sobia Biag(2016)COMSATS University Islamabad: The proposed filter based algorithm uses a bank of Gaborfilter to capture both local and global details in a fingerprint as compact fixed length finger code.

5. Sonia Hof(2008)University of Linz ,Austria: In this paper biometrics is used to identify individuals using face ,iris, retina, palm-print ,etc.

6. Shanu Agarwal(2018): In this the system uses thumb impression for voter identification. The fingerprint is matched with the database if a match is available the person is permitted to fling a vote.

3. DATASETS

Before creating the database, All that have to be done is to collect the appropriate data sets from the user. It takes the following process.

- A. Collect various iris images of the entire citizen using the CASIA database.
- B. Collect the details of the parties who are all participating in the election process.

4. PROPOSED SYSTEM

The main intention of the article is to develop a new idea about voting system and also ensure the security of the system. To ensure the security of the voting system iris recognition is used in the proposed system. The concept of iris recognition is used since every individual has a unique iris. The image of iris can be easily captured. The two main stages are iris verification and iris identification. Iris verification verifies the identity of a person while iris identification establish the identity of the person.

4.1. RELATED CONCEPTS:

The voting system has to be improved in order to avoid the duplication of votes and voting by an unauthorized person without proper verification.

4.2. FRONT END

It collects the details such as candidate information ,iris image, and sends the details to the PHP to access the results from database. Front end is designed using HTML, CSS, Java Scripting languages.

4.3. BACK END

SERVER :It collects the details from the front end

DATA BASE :

- 1) Collect the iris image of all the citizens iris image is collected from CASIA database.
- 2) Collect the details of the candidates who are competing in the election

4.4. TECHNIQUES APPROACHED:

Iris recognition process consists of five major steps they are:

4.4.1 Image acquisition

4.4.2 Segmentation

4.4.3 Normalization

4.4.4 Feature extraction

4.4.5 Matching

4.4.1 IMAGE ACQUISITION:

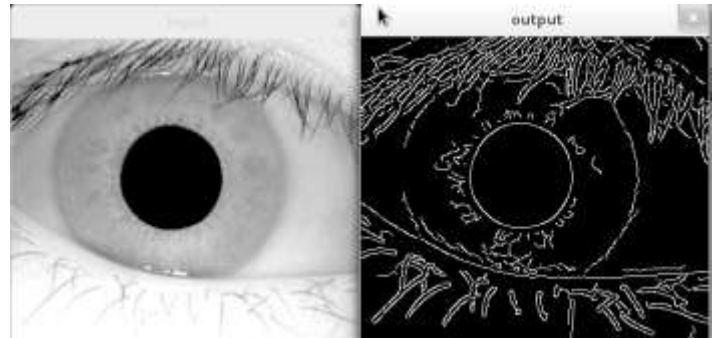
The image of an iris cannot be acquired by camera as it is small in size and also because of the light reflection in the camera. Hence acquiring good image has some difficulties.

We are using CASIA(Institute of Automation Chinese Academy of Sciences)iris image database version 4.0.

4.4.2 SEGMENTATION:

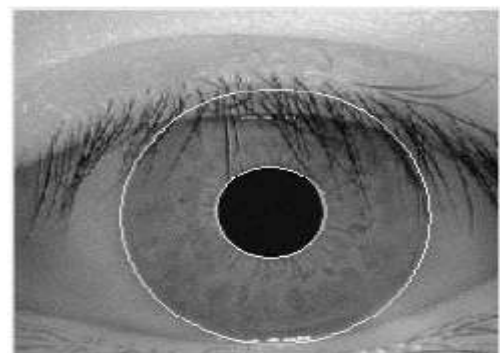
Here we use Hough transformation for Segmentation. The edge detection technique is used before the Hough transform is applied and canny edge detector is used for image extraction. the first step is to find out all the edges in the iris to detect inner and outer boundary of the iris.

A circle is drawn at each edge of iris which has been found earlier with center at the point and with radius needed. X-axis is a value ,y-axis is b value, and z-axis is radius.



Original image

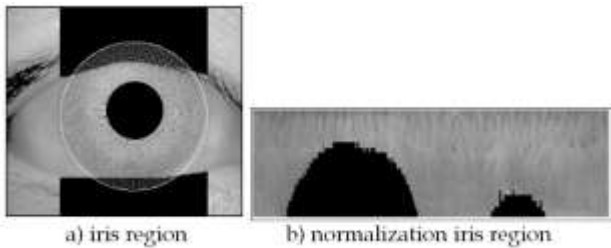
using edge detector



After Hough Transform

4.4.3 IRIS NORMALIZATION:

Dough man’s rubber sheet model is used for normalization of iris. The segmented iris is converted from Cartesian to polar coordinates.



4.4.4 FEATURE EXTRACTION:

In this 1D log Gabor Wavelet is used to create a template representing pattern information.

Feature extraction is implemented by the normalized iris pattern which has been convoluted with 1D log-gaborwavelet. First step of the process is breaking down of the 2D normalized iris pattern into number of 1D signal. Each row corresponds to a circular ring on iris region[14].

After encoding the process produces a bitwise template with a number of bits of information, a noise mask that communicate the area which are corrupted within the iris pattern and mark the corrupted bits .

4.4.5 MATCHING:

In this article matching is done using hamming distance. hamming distance of to templates is calculated by shifting one template left and right bitwise. The successive shifts are used in calculating number of hamming distance

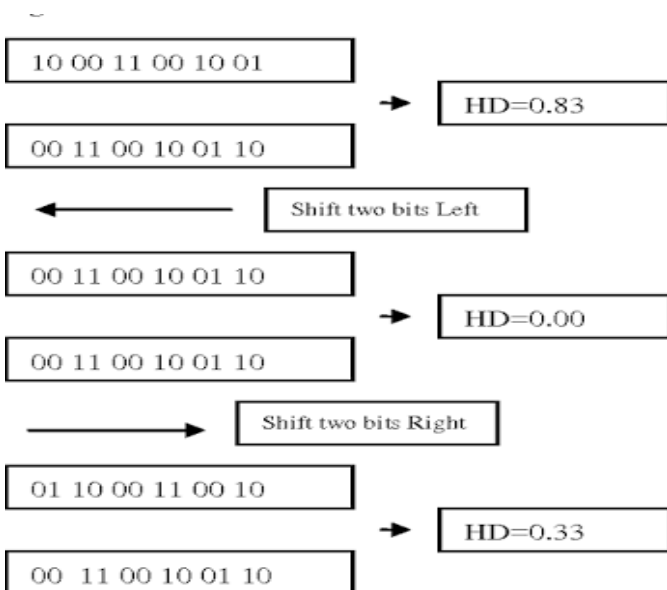
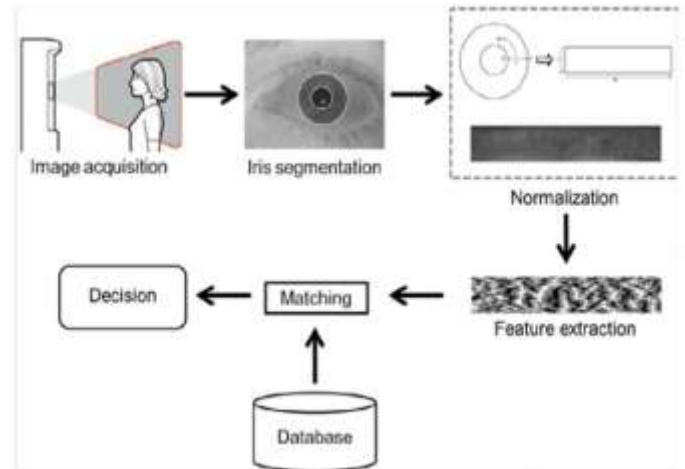


Image of shifting process

5. ARCHITECTURE:



6. RESULT OF SEGMENTATION:

images in the database has been segmented accurately. Only sum of the images in database cannot be segmented accurately.

Circle iris and circle pupil is used to calculate the segmentation value of iris image, this can be done using Hough transform .

7. RESULT OF MATCHING:

There are total of 54,607 iris images are present in the CASIA-Iris V4 which were collected from more than 1800 genuine subjects and 1000 from virtual subjects. The main advantage of CASIA database is that it does not produce any light reflection. The image can viewed clearly .

8. CONCLUSION:

There is a constant increase in the population of our nation day to day, therefore improvement in the voting system is a mandatory thing. Even though there are many biometric techniques we have implemented iris recognition concept for providing high accuracy and this technique also reduces time required. And the important use of this is there is no chance of invalid vote.

9. REFERENCES

[1]. K. Ramya Devi and J. V. Vidhya , "SURVEY ON SECURE ELECTRONIC VOTING SYSTEM",International Journal of Pharmacy &Technology(IJPT),Vol.9,April-2017

[2]Asif Ahmed Anik, Rayees Jameel, Abul Farah Anik, NowrozeAkter, "Design of a solar piwer Electronic Voting Machine", Proceedings of 2017 International Conference on Networking, Systems and Security(NSysS), 5-8 jan.2017,Dhaka,Bangladsh

[3]Htet Ne Oo, Aye Moe Aung, "Design and formal analysis of electronic voting protocol using AVISPA", Proceedings of

2017 2nd International Conference for Convergence in Technology(12CT), 7-9 April 2017, Mumbai, India

[4] John, K. A., and Kofi S. A. M. (2014). IJCSI International Journal of Computer Science Issues. A Trustworthy Architectural Framework for the Administration of E-voting, 11 (30), 97.

[5]ZuyinaAyuningSapturi, AmangSudarsono s, Mike Yuliana, "E-voting security system for the election of EEPIS BEM president", 2017 International Electronics Symposium on Knowledge Creation andIntelligent Co putting (IES-KCIC), 26-27 Sept. 2017, Surabaya, Indonesia.

[6]NoureddineCherabit, Fatma Zohra Chelali, Amar Djeradi, "Circular hough Transform for Iris localization" Science and Technology, PISSN: 2163-2669, e-ISSN: 2163-2677, 2(5): 114-121, 2012.

[7]Krzysztof Misztal, Emil Saeed, Jacek Tabor, and Khalid Saeed, "Iris Pattern Recognition with a New Mathematical Model to Its Rotation Detection", Human Identification by Vascular Pattern (pp.43-65), November 2012.

[8] Caroline Houston, "Iris Segmentation and Recognition Using Circular Hough Transform and Wavelets Features", Rochester Institute of technology.

[9] Richard Yew Fatt Ng, Yong Haur Tay, Kai Ming Mok, "A Review of Iris Recognition Algorithms", 2008 International Symposium on Information Technology, Volume: 2, ITSIM 2008.

[10] Libor Masek, "Recognition of Human Iris Patterns for Biometric Identification", The University of Western Australia, 2003.

[11] K. Seetharaman, R. Ragupathy, "Iris Recognition for Personal Identification System", ICMOC-2012,India

[12] Z. Zainal Abidin, M. Manaf, A. S. Shibghatullah, S.H. A. MohdYunos,S.Anawar, Z. Ayop, "Iris Segmentation Analysis using Integro-Differential Operator and Hough Transform in Biometric System", Journal of Telecommunication, Electronic and Computer Engineering, ISSN:2180-1843 Vol. 4 No. 2 July -December 2012.

[13] U T Tania, S M AMotakabber and M I Ibrahimy, "Edge Detection Techniques for Iris Recognition System", IOP Conference Series: Materials Sciences and Engineering, Volume 53, conference 1, 2013.

[14] K. Seetharaman, R. Ragupathu, "Iris Recognition for Identification System", Procedia Engineering, Volium 38