



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 10, Issue 8, August 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.569

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 6381 907 438

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Automatic Voter Identification Intelligence System (VIIS)

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ABSTRACT: Nowadays election in the world for making the voting is mainly by physical appearance. So especially in India, Electronic Voting Machines (EVM's) are used, but there are so many controversies being seen already in India. So before making voting in these elections we propose another system that is Voter Identification Intelligence System (VIIS). We give the best option for making the conformation of citizens so that he can vote confidentially in the booth by taking all concerns for identification of the citizen. The proposed work is a combination of retina identification, the skull, and all possible biometrics parameters to make the signature code which gives an intern identification of Aadhar ID number or any identification documents. The Voter Identification Intelligence System (VIIS) using (AI and Blockchain Technology) is ensured to make the current voting process take place in an appropriate, accurate, and highly secure way.

KEYWORDS: Text Artificial Intelligence, IOT, Electronic Voting Machine, Image Processing, Biometric.

I. INTRODUCTION

The proposed system, VIIS give the best solution for making the conformation of citizen so that voters can vote confidentially in the e-booth by taking all concerns for identification of the citizen. VIIS is the combination of all possible biometrics parameters to make a signature code that gives in the tern identification of Aadhar ID number or any identification documents. So mainly problem definition is - To identify the right voter, to make the current voting process take place in an appropriate, accurate, and highly secure way, as a step towards Digitization and thereby reduces the effort put by election staff members and voters.

II. CURRENT SITUATION OF VOTING PROCESS

In most countries, an on-site method is used and it is the most preferred procedure to organize an election in an accurate way and for that Electronic Voting machines (EVM) are used. Introduction to the EVM has successfully reduced the cost and the time involved to complete the process but there are many controversies in the history of EVM since they are used. There are some conflicts with existing system security. There is no way for the system to double-check or validate voters. There is only one manual way for validating a person to be a voter. We can add some more security levels to increase the accuracy so gradually election can be organized in a sincere and appropriate way.

III. LITERATURE SURVEY

1. S. N. Kavitha , K. Shahila , S.C. Prasanna Kumar et.al[1]2018 [4] This paper presents a framework of the voting system using the approaches of the different optimized algorithms. The author exploits the inherent correlation between biometric parameter and voting system in India. Therefore, it was used to conduct the voting process in a sincere and highly secure way. In this work, the system, secured biometry balloting planned with Aadhar card, Fingerprint, and Iris of an elector. This system ensures the voter before permitting to cast their vote. Using an object tracking algorithm, faces are detected. This algorithm will help to detect noise and motion blur effects. This paper concentrated on mainly two algorithms. Viola-Jone Algorithm for

face detection and minutiae matching algorithm for fingerprint scanning, extraction, and matching. Feature extraction and for improvement, the bar grapheffort algorithm is used.

2. T.M.Roopak , R Sumathi IEEE, 2020[2] The author proposed a voting system framework based upon Aadhar Id and Blockchain technology. Here the paper is the main specializing in Virtual ID from the Aadhar ID that promotes the service suppliers to form verification. Via the Aadhar databasesystem extract the fingerprint details of the voter. The author also used block chain technology in the e-voting system. Cryptographic techniques of Blockchain technology are used for encryption and decryption. The fingerprint is the digital signature key for encryption.
3. MaheenZulfiqar, Fatima Syed, Muhammad Jaleed Khan, KhurramKhurshid, IEEE, 2019 The author proposes a face recognition system based on a neural network. In this paper, they propose different methods like Data Specifications, Face Detection, Data Augmentation, Face Recognition to increase the accuracy level of their System. The accuracy of the system is 98.76 The algorithms used in the system are Viola-Jones face detector and pre-trainedCNN for face recognition. Large dataset is created by taking 10 images of each person; images are taken with different noises and brightness conditions. The proposed system can be used in criminal identification, web search by image, automated attendance Systems.
4. Di Wang, Hongzhi Yu, Ding Wang, Guanyu Li, IEEE, 2020 [1] The author proposes a system using CNN, that will help to detect and match a face with high efficiency concerning response time and required space for that. Nowadays elections in the world for making voting are mainly by physical appearance.– This is an improvement on an existing system where the accuracy of the improved model is 79.41 percent and this algorithm also has some space for an improvement to increase accuracy. This paper includes two architecture processes. The first step of the process includes optimization of an algorithm, which will identify the voter second stage of architecture is face recognition in CNN where the overlapping images and its defect of detecting faces and varying image size minimized by the face detector itself
5. Khadija Hasta, Aditya Date, AparnaShrivastava, PrajaktaJhade, S. N. Shelke, IEEE, 2019 [5] This paper determines that evaluated fingerprint and verification methods provide a complete solution for secured voting with higher accuracy, better response rate. The scope of this paper is to vote confidently, with help of the domain Internet of Things using Arduino. Here the voting machine depends on the fingerprint. Image is passed over a module to extract the relevant feature. The data is stored in the Database of a fingerprint. The voter is ready to cast votes, the biometric parameter authenticates with the voter in the Database. The system allows the authentication to vote for a user at once and does not allow to draw a vote again.

IV. MOTIVATION

Nowadays elections in the world for making the voting is mainly by physical appearance. So, especially in India, Electronic Voting Machines (EVM's) are used, but there are so many controversies being seen already in India. So before making voting in these elections we propose another system that is Voter Identification Intelligence System (VIIS). We give the best option for making the conformation of citizens so that he can vote confidentially in the booth by taking all concerns for identification of the citizen. The proposed work is the combination of retina identification, the skull, and all possible biometrics parameters to make the signature code that gives in the intern identification of Aadhar ID number or any identification documents. The Voter Identification Intelligence System (VIIS) using (AI and Blockchain Technology) is ensured to make the current voting process take place in an appropriate, accurate, and highly secure way.

V. PROBLEM DEFINITION

VIIS give the best solution for making the conformation of citizen so that voters can vote confidentially in the e-booth by taking all concerns for identification of the citizen. VIIS is the combination of all possible biometrics parameters to make a signature code that gives in the tern identification of Aadhar ID number or any identification documents. So mainly problem definition is - To identify the right voter, to make the current voting process take place in an appropriate, accurate, and highly secure way, as a step towards

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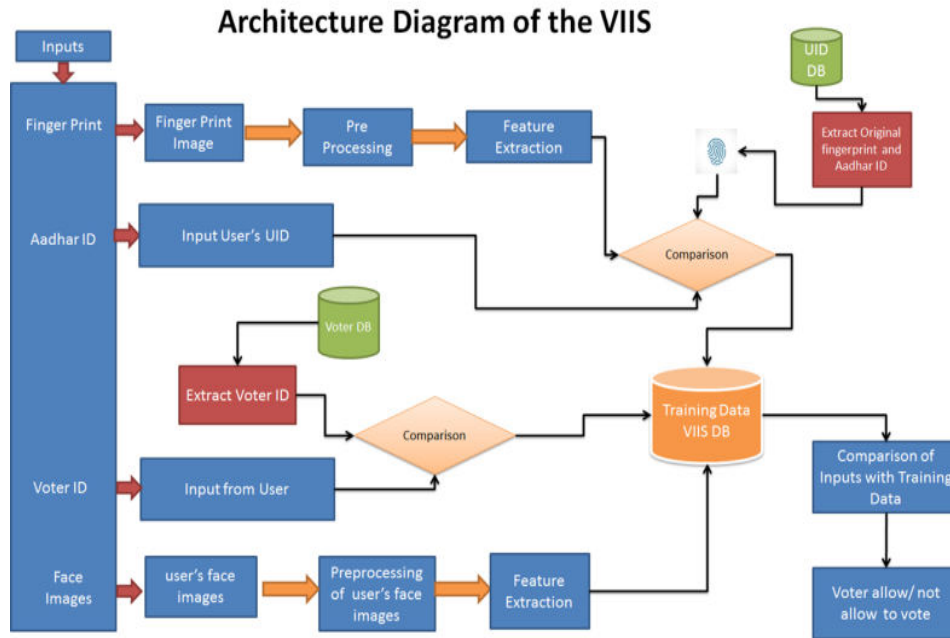


Figure 1 Architecture of VIIS

VI. REGISTRATION PROCESS VIIS

The Aadhaar number, fingerprint, voter id, and facial images will be used as user inputs. Registration is the first step in this project. So the user has to give the Aadhaar number and fingerprint first. So by pre-processing the fingerprint image scanned by the user, the features will be extracted from it. This will be taken by validating the Aadhaar number. The Aadhaar ID and fingerprint will be extracted from the UID data held by the government. Data is stored in the VIIS database only if the data entered by the user and extracted input will be matched with UID data. Only then will the user go to the next stage. The next step is to take voter ID as input from the user and this is the third input. Will be taken only after validation on voter ID. The Voter ID will be extracted from the Voter DB held by the government. If the inputted Voter ID is matched with the extracted Voter ID from the Voter DB, then voter information is saved in the VIIS database. Only then will we move on to the third stage. In the third stage, only the image of the user's face should be taken. Pre-process it and keep it in VIIS DB.

VII. KEY POINT DETECTION AND EXTRACTION SYSTEM

The pre-processed inputs from the registration system are given as input to the VIIS system. This system consists of a trained model to detect and estimate. This model detects voters his/her key points. And those detected key points are extracted and stored in a format to be used for the next model for future identification.

Voter Identification

After that VIIS DB will be trained. You will use them on the voting day. Then the voter can vote only if not otherwise. So this is how the VIIS will be built.

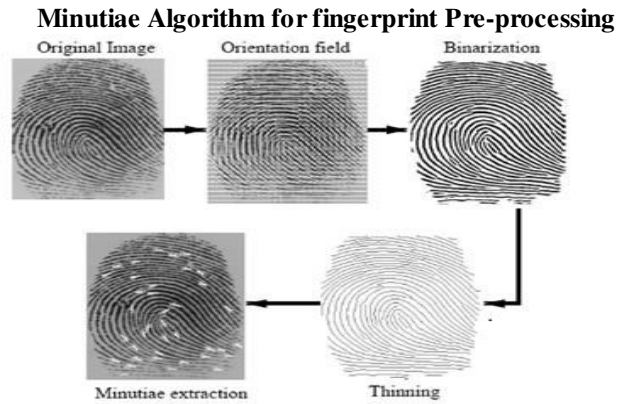


Figure 2 Pre-processing

The pre-processing which helps to operate and convert raw data into useful material by some data mining operation. So, in this part system will take inputted data and decode the JPEG content to RGB grids of pixels with channels. Thinning an image greatly reduces spikes and smoothing out the edges, emphasizes the image. Thinning of image help in the not only to join broken part, but also to remove unwanted spikes.

VIII. FEATURE EXTRACTION

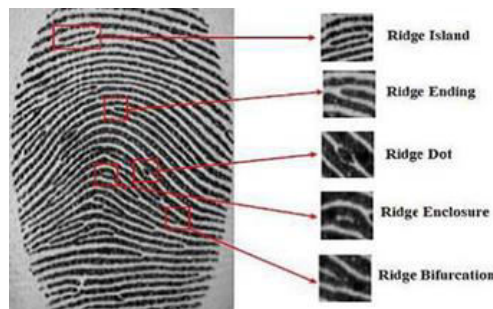


Figure 3. Feature Extraction

The extraction of features is the next step. Pre-processing extraction involves finding the Bifurcations of Ridge and Ridge Endings. Each minutia is labelled using the coordinates of the location and the Minutiae map. The fingerprints will be defined by the fingerprint feature vector and simple pattern matching is used.

Hardware and accessories:

1. GPU Aided Laptop: For Training the Model.
2. Webcam.



Figure 4 Webcam

A webcam is capturing a face and Iris though it.

3. Finger Print Scanner: Use to scan a finger print.
4. Computer System.
5. RAM 8 GB or above.

IX. CONVOLUTION NEURAL NETWORK

Convolutional neural networks (CNNs, or ConvNets) are a kind of deep neural network often used to evaluate visual imagery in deep learning. Considering their collective architecture and interpretation invariance characteristics, they are also known as SpaceInvariant Artificial Neural Networks (SIANN) or shift invariant. They're useful for both image and video processing, so they're highly recommended. Multilayer perceptrons are integrated variations of CNNs. The next layer of Multilayer perceptrons is probably totally interconnected neurons and ensure that each neuron in one layer is bound to all neurons in the next layer. This absolute connection makes the flow of information possible. Adding some kind of variance adjustment of weights to the loss function is a common method of regularisation. CNN takes they benefit from knowledge sequencing patterns and integrate additional advanced patterns victimization smaller and less complicated patterns. In the system, CNN architecture is the model for the detection of key points in a face image captured by a camera. Those detected key points are used to predict future voterface.

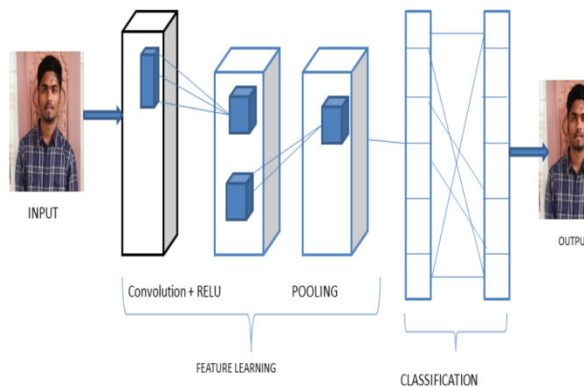


Figure 5. CNN

▪ Convolution layers

The convoluted layer is that the core building block of CNN. Layer parameters embrace a set of learnable results, with a tiny, low responsive field, however extending to the whole depth of the input. Throughout the aerial, the input of every filter is compiled to the dimension and height of the amount, calculating the inner output between the filter logs and thus making a two-dimensional activation map of the input which filter. The network learns filters that are activated once it finds features at a selected location within inputs

▪ Pooling layers

Like the convoluted layer, the pooling layer can reduce the Spatial size of the compiled feature. This is to lower the computing power need to operate the data by reducing the parameters. Moreover, it is useful removing the key features of the recurring and thus retaining the effective training prototype procedure. These two types of pooling Maximum pooling and average pooling. Gets the maximum value from the maximum pooling Part of the image projected by the system. Average pooling derives an average of all values from that area Image protected by the kernel.

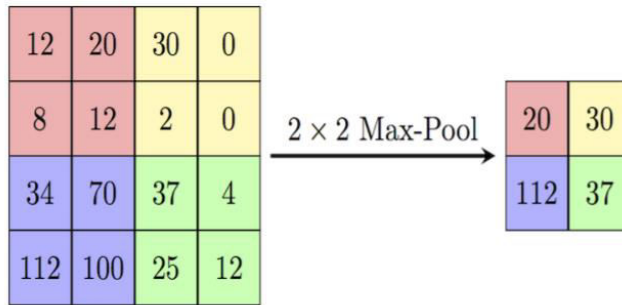
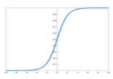
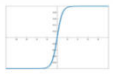




Figure 6 Pooling

▪ **Activation Function**

An activation mechanism is a node that is located between or at the end of neural networks. This will aid in determining whether or not the neuron is involved. This function transforms an input signal into a non-linear output signal, which is then sent to the next layer as input.

Activation function	Equation	Graph
Sigmoid	$S(x) = \frac{1}{1 + e^{-x}}$	
Tanh	$\tanh x = \frac{e^x - e^{-x}}{e^x + e^{-x}}$	
ReLU	$RELU(x) = \begin{cases} 0 & \text{if } x < 0 \\ x & \text{if } x \geq 0 \end{cases}$	
Leaky ReLU	$f(x) = \begin{cases} x & \text{if } x > 0 \\ 0.01x & \text{otherwise} \end{cases}$	

▪ **Fully Connected layer**

Connected layers help to reasoning in the neural network. Several controversial and most pooling layers, high-level reasoning. The absolutely connected layer is formed by Neural network. Transmitted neurons act as connected layers. As seen within the ANN, there are unit connections to any or all the activities within the previous layer. Their actions will be lived as a measure Transformation, then matrix operations with bias offset (as vector addition) Learned or mounted bias term).

X. **RESULT ANALYSIS**

Our system give a better solution for identify right voter. VIIS make the current votingprocess to take place in an appropriate, accurate and highly secure way. VIIS provide high security. As a step towards Digitization and thereby reduces the effort put by election staff members and voters.

Fundamentally the goal of this system is to identify the right voter at e-booth on election day, this process will be of 2 Steps.

Registration

1. Input of registration(x) = [Voter ID, Adhar ID, Fingerprint of Voter]
2. Compare x with UID database(y) if x==y then capture the Image of voter.
3. output of registration = Store the details in VIIS Database(x1)

Voting

1. Input (y1)= [Voter ID, Adhar ID, Fingerprint of Voter, Face Image of Voter]
2. if x1==y1 then voter can cast the vote otherwise not.



XI. CONCLUSION

We have implemented an automatic text detection technique from an image for Inpainting. Our algorithm successfully detects the text region from the image which consists of mixed text-picture-graphic regions. We have applied our algorithm on many images and found that it successfully detect the text region.

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