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# Fingerprint Enabled Voting System Using ANN Classifier

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## ABSTRACT

In our proposed work we have introduced some new concepts and that is implementing by Biometric Identifier.
Secured voting. It reduces man power efficiently. Throughout the project, we have been able to develop a Electronic Voting Software which manages and maintains the voter's information and biometric data of the voters.
The wiener filter is used for pre-processing the input image.
The Discrete Cosine transforms and Discrete Orthogonal Stock well transform is used for image segmentation.
The Grey Level Co-Occurrence Matrix is used for feature extraction and finally Artificial Neural Network is used for validating the finger print based Voters.
This project is implemented using python.

## I. INTRODUCTION

A digital signature is basically a way which provides the authenticity to an electronic document. A data stream concatenates a message with a valid entity called digital signature. The concept of Digital Signature is first having given in new direction cryptography by Diffie and hellaman. Authenticity ensures the legitimacy of document as well as the person who created it. It also gives a guarantee that not any other person changed it since an authentic people developed it.
Digital signatures count on some kind of encryption to give a guarantee of authenticity. Encryption is a method in which we convert to message or file in such a format that when we send to it from one system to be other than no one decrypt it except the person who possess a key. Authentication ensured that the message that we get come from a right person. Digital signature shows that the data which we receive coming from a right people, it also showed a message cannot be denied or alter by a sender later the submission. Digital signatures are basically applied for financial transaction, distribution of software, in cases of controversy where we want to check for tempering of digital information.
Blind Signature is a technique in which a user can get the sign on document from a signer without showing the information that it stored. In Blind Signature technique, the basic motive is getting the signature from a person without revealing secret information that document possessed. The property of Blind

Signature is that requester can be enabled to get the signature, but the signer party does not have any capability of making relation between signature and document. When requester released the signature pair, both requester and signer will not be able to link their pair. Apart from authentication blind signature also satisfied Unforgeability, untraceability also. The blind signature scheme should preserve the following requirement:

❖ **Blindness**

The message should be blind for a signer, on the other hand, we can say that signer also not disguised the original content.

❖ **Unforgeable**

An adversary even if he can imitate the user and freely interact to the signer must not produce or copy a true signs on other documents except for that signer signed.

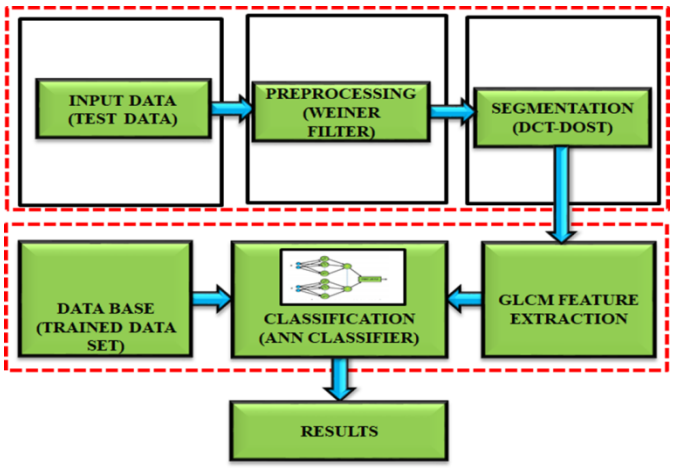
❖ **Correctness**

The Blind signature scheme must be correct.

❖ **Unlinkablity**

A malicious signer must not be able to link output final signature to the user for separate interaction with the user.

## II. ELECTRONIC VOTING MACHINE:




The EVM was designed by Election Commission of India in partnership with 2 public sectors: Bharat Electronics Limited, Bangalore and Electronics Corporation of India Limited, Hyderabad.

EVMs are more voter-friendly and much simpler from Paper ballot. EVMs voting save time, energy and money and thus save millions of trees in this process.

EVMs reduce the time in casting vote and also reduce the time. And utilizing this machine, count votes and declare results.

Recently, that the systems could be tampered with and the security could be changing the votes, but this has not been proved. it save papers.

These machines are powered by batteries and do not require electricity which ensures uninterrupted voting. it can accommodate sixty-four voter in a single constituency.

## III. EXISTING SYSTEM

The Internet-voting system (IVS) empowers an electorate to formulate his opinion through the election process and permits him to cast a ballot of his choice over the internet. The IVS conducts a smooth and fair election with the high participation rate of voters, but the primary concern with the IVS system includes the integrity of a ballot, voter anonymity, ballot stuffing, and transparency of election process .Recently, the end-to-end verifiable internet voting (E2E-VIV) system has introduced that guaranteed transparent by providing a receipt to each voter at the end of the voting process. In the E2E-VIV system, a receipt allows a voter to check if his vote was cast as intended, recorded as cast, and tabulated as recorded using an audit mechanism .The receipt does not allow the voter to prove to others how he voted or to whom he voted for. The notion of E2E-VIV is a decade old but designing and building its architecture with high security remains a challenge.

The first electronic voting system (EVS) was achieved by accepting the mix-net approach where the number of machines reorganized the encrypted votes to

conceal the relationship between a voter and his vote. Other cryptographic tools used for implementing the EVS system include the blind signature scheme, holomorphic cryptosystem, proxy servers, and secret sharing mechanism, threshold encryption, and zero-knowledge proof. Recently, cryptographers and academicians have shown good interest in the hash-chain and block chain technology, and verifiable computing for the e-voting construction.

The receipt enables the voter to check his vote in the ballot list and the public to check all votes are counted correctly. Under the well-known elliptic curve discrete logarithm (ECDL) and gap Diffie–Hellman (GDH) assumptions and random oracle model (ROM), the proposed system is existentially unforgeable under the chosen message and identity attack. Also, the proposed system allows a voter for early voting. We show that the proposed system performs well as compared to other related EVS systems. Additionally, we show that the proposed system supports batch verifiability, i.e., it simultaneously verifies multiple votes and ballots.

## IV. PROPOSED SYSTEM

In our proposed work we have introduced some new concepts and that is implementing by Biometric Identifier. Secured voting it reduces man power efficiently. Throughout the project, we have been able to develop an Electronic Voting Software which manages and maintains the voter's information and biometric data of the voters.

## V. MODULE IMPLEMENTATION

### PREPROCESSING

Pre-processing routines prepare the data for analysis. Before we start the actual processing, the data has to be pre-processed to remove the detector effects. Pre-processing is the most important aspect of data processing. When data is acquired as an output of an experiment, the next step is modelling the data to extract useful information. Globally the data output could be either large, too little or fractured. Pre-processing of data includes classifying the data into one of these three kinds and processing accordingly. Hence, data filtering, data ordering, data editing and noise modelling play an important role in any data pre-processing. MATLAB® has routines like 'resampling', 'decimate' which help us achieve some of these aspects.

## VI. WEINER FILTER

In signal processing, the Wiener filter is a filter used to produce an estimate of a desired or target random process by linear time-invariant (LTI) filtering of an observed noisy process, assuming known stationary signal and noise spectra, and additive noise.

The Wiener filter is the MSE-optimal stationary linear filter for images degraded by additive noise and blurring. Calculation of the Wiener filter requires the assumption that the signal and noise processes are second-order stationary (in the random process sense).gif For this description, only noise processes with zero mean will be considered (this is without loss of generality).

Wiener filters are usually applied in the frequency domain. Given a degraded image x(n,m), one takes the Discrete Fourier Transform (DFT) to obtain X(u,v). The original image spectrum is estimated by taking the product of X(u,v) with the Wiener filter G(u,v):

$$\hat{S}(u,v) = G(u,v)X(u,v)$$

The inverse DFT is then used to obtain the image estimate from its spectrum. The Wiener filter is defined in terms of these spectra:

$H(u,v)$ Fourier transform of the point-spread function (PSF)
$P_s(u,v)$ Power spectrum of the signal process, obtained by taking the Fourier transform of the signal autocorrelation
$P_n(u,v)$ Power spectrum of the noise process, obtained by taking the Fourier transform of the noise autocorrelation

## VII. SEGMENTATION

In digital image processing and computer vision, image segmentation is the process of partitioning a digital image into multiple segments (sets of pixels, also known as image objects). ... Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.)

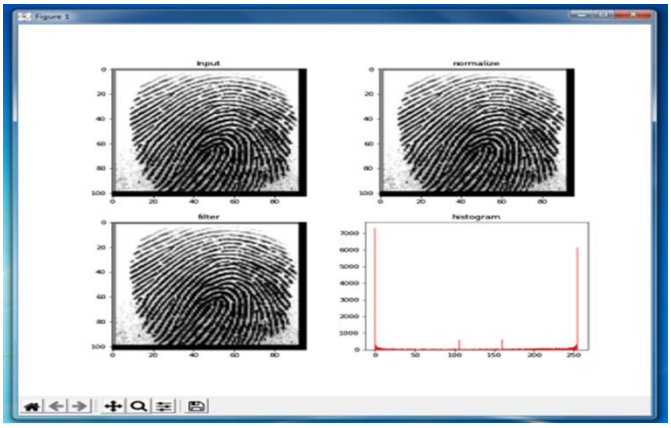
Image Segmentation is the process by which a digital image is partitioned into various subgroups (of pixels) called Image Objects.

The concept of partitioning, dividing, fetching, and then labeling and later using that information to train various ML models have indeed addressed numerous business problems. In this section, let's try to understand what problems are solved by Image Segmentation.

A facial recognition system implements image segmentation, identifying an employee and enabling them to mark their attendance automatically. Segmentation in Image Processing is being used in the medical industry for efficient and faster diagnosis, detecting diseases, tumors, and cell and tissue patterns from various medical imagery generated from radiography, MRI, endoscopy, thermography, ultrasonography, etc.

Satellite images are processed to identify various patterns, objects, geographical contours, soil information etc., which can be later used for agriculture, mining, geo-sensing, etc. Image segmentation has a massive application area in robotics, like RPA, self-driving cars, etc.

### 7.1 DCT-DOST




The discrete cosine transform (DCT) helps separate the image into parts (or spectral sub-bands) of differing importance (with respect to the image's visual quality). The DCT is similar to the discrete Fourier transform: it transforms a signal or image from the spatial domain to the frequency domain.

The DCT is a technique allowing the conversion of a signal into elementary frequency components. More in particular, in the DCT the input signal is represented as a linear combination of weighted basis functions that are related to its frequency components.In general, the DCT does not directly reduce the number of bits required to represent the block.

The discrete orthonormal Stockwell transform for image restoration. The technique is based on the Stockwell transform (ST) and its discrete version, the discrete orthonormal Stockwell transform (DOST). These mathematical transforms provide a multi resolution spatial-frequency representation of a signal or image.

### 7.2 FEATURE EXTRACTION

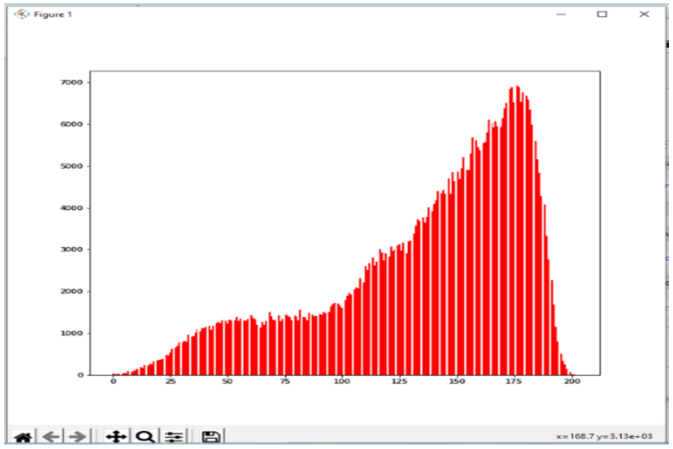
Feature extraction techniques are helpful in various image processing applications e.g. character recognition. As features define the behavior of an image, they show its place in terms of storage taken,

efficiency in classification and obviously in time consumption also.

In real life, all the data we collect are in large amounts. To understand this data, we need a process. Manually, it is not possible to process them. Here's when the concept of feature extraction comes in.

Suppose you want to work with some of the big machine learning projects or the coolest and popular domains such as deep learning, where you can use images to make a project on object detection. Making projects on computer vision where you can to work with thousands of interesting project in the image data set. To work with them, you have to go for feature extraction procedure which will make your life easy.

### 7.3 GLCM ALGORITHM




GLCM Algorithm is used for Feature Extraction. The texture filter functions provide a statistical view of texture based on the image histogram. These functions can provide useful information about the texture of an image but cannot provide information about shape, i.e., the spatial relationships of pixels in an image.

Another statistical method that considers the spatial relationship of pixels is the gray-level co-occurrence matrix (GLCM), also known as the gray-level spatial dependence matrix. The toolbox provides functions to create a GLCM and derive statistical measurements from it.

This section includes the following topics.

- Creating a Gray-Level Co-Occurrence Matrix
- Specifying the Offsets
- Deriving Statistics from a GLCM
- Example: Plotting the Correlation

### 7.4 CLASSIFICATION

Image Classification. The intent of the classification process is to categorize all pixels in a digital image into one of several land cover classes, or "themes". This categorized data may then be used to produce thematic maps of the land cover present in an image.

Image classification is a complex procedure which relies on different components. Here, some of the presented strategies, issues and additional prospects of image orders are addressed. The primary spotlight will be on cutting edge classification methods which are utilized for enhancing characterization precision.

### 7.5 ANN CLASSIFIER

Image processing using artificial neuronal networks (ANN) has been successfully used in various fields of activity such as geo technics, civil engineering, mechanics, industrial surveillance, defence department, automatics and transport. ... The matrix is used as input data into the neuronal network.

ANN Classification is the process of learning to separate samples into different classes by finding common features between samples of known classes. ANN Classification is an example of Supervised Learning. Known class labels help indicate whether the system is performing correctly or not.

## VIII. CONCLUSION

We have discussed an end-to-end verifiable Internet-voting system (E2E-VIV), in which each voter is authenticated using a unique identifier issued by the appropriate authority and his biometric information. First, we have discussed the architecture of proposed

E2E-VIV system, and then provided its implementation. We have presented a functional digital signature for anonymously issuing a blank ballot to a voter and used the BLS short signature scheme for protecting the vote from any modification. The proposed system is secured against the existential forgery attack under chosen message and ID. It needs least machine cycles as compared to the existing schemes. Further, it requires the least bandwidth cost for the blank ballot and vote ballot. It also allows the batch verifiability to verify multiple ballots and vote-ballots simultaneously.

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