# Verification of Fingerprint of Transgender with Male and Female

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***Abstract*- Each person is having his/ her unique fingerprints. It is almost impossible to have same finger print patter no fanyto or more than two person, doesn't matter even they are twins. Thefingerprintsremainsunchangedthroughouttheli feofhumanbeingevenafterdamaged due to some activates, it rest or esas original after cure. We know that the impression of the patternofridgesonafingerisnothingbutafingerprint. Aridgeisasinglecurvedsegment and a valley is the region between two adjacent ridges.In this paper the fingerprint of transgender shows most of the characteristics like male origin.**

***Indexed Terms- fingerprint, transgender, ridges, valleys, Transform.***

## I. INTRODUCTION

We have collected fingerprints of transgender persons for the research purpose.The set of features for fingerprint identification is defined by Galton and henry. The pattern consist of ridgeen ding which can be defined as the point where the reistermination of ridge curve. There is one bifurcation, which is the Y junction where a ridge splits into twopaths.Thefixedpointofimpressioniscalledcoreandd elta.Theinnerterminusofthe pattern is called core and the outer terminus is called delta. The pores are the outlets of sweat glands. We know that various biometric techniques are under consideration for example finger-print analysis, face recognition, hand and finger geometry, iris recognition, signature, palm print image, voice identification, etc..For the person identification, behavioural characteristic, physiological characteristic of human can be used. As the fingerprint is having high uniqueness, high permanence, high performance and high circumvention therefore the finger print is more suitable for the identification of gender.

## II. LITERATURE REVIEW

- Maio et al. 2002 [26],Propose fingerprint configuration, in this system four different data base were collected by using following sensors / technologies DB1: optical sensor, DB2: capacitive sensor, DB3: optical sensor, DB4: synthetically generated based on the method proposed. Each database is of 110 fingers wide (w) and eight compression per finger deep (d) (880 fingerprints in all); fingers from 101 to 110 (set B) were made available to made participant to allow parameter tuning before the submission of algorithms, the benchmark is then constituted by fingers numbered 1 to 100 (set A). Each off our database contained 880 finger prints from 110 different fingers, collected using "three bears rule" based on experiences with finger print recognition algorithm on the other hand avoided collecting perfect fingerprints which will very easy for a matching a algorithm, some internally developed algorithm helps in accomplishing this task. Each database was split into different "test" set of 800 images (set A) and an open "training" set of 800 images (set B), made available to participants for algorithm tuning. The sample in each set B were chosen to the as much as possible representative of the variations and difficulties in corresponding set A, A final visual inspection obtain data sets was carried out to assure that "dry", "wet", "scratched", "distorted" and "markedly rotated" fingerprint were also adequately represented. Its result provide useful overview of the state of art in this field, allows researchers and companies to test their algorithms over common database collected using sensors and provide guidance to the participants for improving their algorithm.

- Xinjian Chen et al. 2006 [23], A proposed an algorithm for distorted finger print matching based on local triangle feature set. Proposes novel method, a fuzzy feature match (FFM) based on local triangle feature set to match the deform fingerprints. The finger- print is represented by fuzzy feature set: local triangle feature set. A similarity between the fuzzy features set is used to characterise similarity between finger prints. A similarity measure for two triangles is introduced and extended to construct similarity Vector including the triangle level similarities for all triangle sin two finger prints. Accordingly a similarity vector pair is defined to illustrate the similarities between two fingerprints. The FFM method match the similarity vector pair to normalized value which quantifies the overall image to image similarity. The proposed algorithm has been evaluated with NIST 24 and FVC 2004 fingerprint data bases. FFM based on local triangle feature set is reliable and effective algorithm for fingerprint matching with nonlinier distortions. In addition this algorithm is good at processing time, the average for matching two minutiae set as about1.1s.

- UdayRajanna, Ali Erol, George Bebis 2009 [25],Proposed a comparative study involving four different feature extraction methods for fingerprint classification and pro- posed rank based fusion skim for improving classification for performance. Specifically they compared two well-known features extraction methods based on orientation maps (OMs) and Gabor filters with two new methods based on “Minutiae maps” and “Orientation co linearity”. Each feature extraction method was compared with each other using the NIST-4 data base in terms of accuracy and time. More ever they investigated the issue of improving classification performance using rank level fusion. When evaluating each feature extraction method individually, OMs perform the best. Gabor features fell behind OMs interms of classification accuracy. They also experimented a rank level fusion skim to improve the classification accuracy.

## III. SYSTEM DEVELOPMENT

- Gender Identification Process

The fingerprints are collected from the various group of persons by using the fingerprint scanner.Thesefingerprintarestoredinthedatabase.Ther eiswiderangeofapplications like forensic, civilian, unique identification that is Aadhar Card, etc.

- Feature extraction

The fundamental step for any pattern recognition and machine learning problem is feature extraction. The various methods like singular value decomposition, discrete wavelet transform can used for the extraction of feature from the finger print image. Singular Value Decomposition is used to get eigen vector and 2D Discrete Wavelet Transform is useful for energy vector determination. Unless the finger print image is used as input, it is very difficult to obtain the feature vector. 2D - Discrete Wavelet Transform will decompose and image into the sub bands. That some bands are localized in frequency and orientation. Mainly in high frequency sub band images, this process is further used to isolate small changes in an image. Thus 2D - Discrete Wavelet Transform is more suitable tool which can be used for the designing of gender classification system

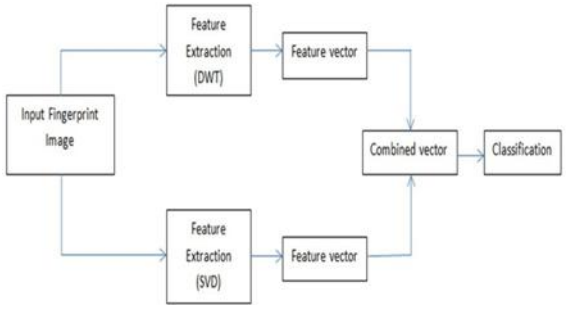



Figure 1: Block Diagram of Proposed System

Fig 2 Fingerprint and Processed Parts of it

- Classification of fingerprint

The fingerprint image used for the purpose of identification is given as a test image to the proposed system. After extraction of features by various

methods, the feature vectors are combined. With the help of combined vectors, Singular Value Decomposition, Discrete waveletTransform and the Histogram, the result can be obtained which will be the best of three methods.

- Gender Classification Approach

Biometric traits like fingerprint, face, hand shape, iris and voice identifying demographic attributes of humans such as age, gender and ethnicity using computer vision has been given increased attention in recent years. Such attributes can play a very vital role in many applications such as human-computer interaction, surveillance, content-based indexing and searching, biometrics, demographic studies and targeted advertising.

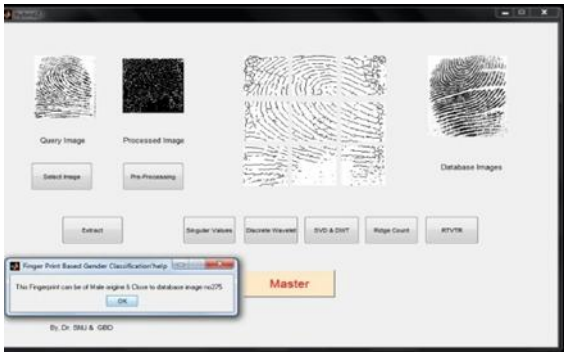
- Need of Gender Classification

The gender classification from the biometrics like fingerprints is an important step in forensic department in order to identify the gender of a criminal and minimize the list of suspect's search. In a very good way, human-computer interaction systems can be built if they are able to identify a human's attribute such as gender. The given system can be made more human-like and respond appropriately. A simple scenario would be a robot interacting with a human; it would require the knowledge of gender to recognize the human appropriately. In Smart cities as the automation is applied everywhere, it can assist in restricting areas to one gender only, such as in a train coach or hostel. Automated surveillance systems can choose to pay more attention or assign a higher threat level to a specific gender. In biometric systems, using fingerprint recognition, the required time for searching the fingerprint database can be cut down and different fingerprint recognizers can be trained for each gender to improve accuracy.

- Usefulness of Fingerprint Biometrics in Gender Classification

Fingerprint identification is the oldest forensic discipline known to man. Fingerprints have proved over time to be the most rapid, reliable, and cost-effective means by which to identify unknown deceased individuals. Its feature is permanence and universally accepted. Fingerprint biometric have a rich source of information and fingerprints are generally left at crimes spot. Fingerprints are easily captured, stored, processed and used in forensic science and other applications. Fingerprints are left each time the finger contacts a surface at crime spot. Availability of small and inexpensive fingerprint captures devices.

## IV. RESULTS

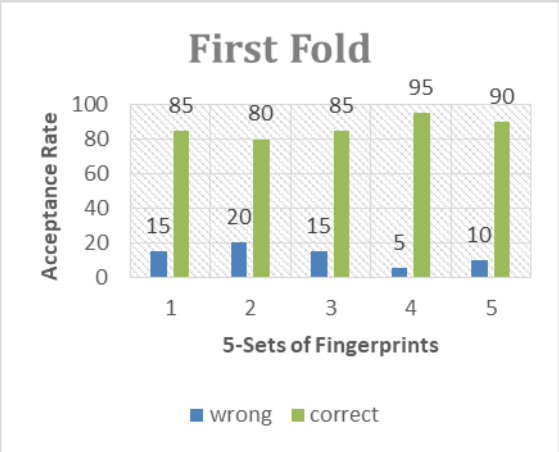



(a)


(b)

Fig. 3: Results


Fig.4: Final result window




Graph 1: Acceptance rate

## V. CONCLUSION

In this paper we have verified ten samples of fingerprints from transgender and also from males and females. After feature extraction and comparison, we have found that the features of transgender fingerprints mostly tending towards male fingerprints characteristics.

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