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FINGER VEIN IDENTIFICATION AND RECOGNITION

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ABSTRACT

This Research paper includes information about Finger Vein Identification and Recognition that's extra used and trending these days in software industries in addition to in lots of regions cutting edge existence in previouscouple of years in phrases of protection software needs excessive securities, excessive accuracy, excessive speed.Although the existing strategies of identity and popularitythrough password, pin-code, styles, cards, face detection and signature convey the hazard of fats loss, theft, unauthorized use and forgery. In finger vein identity and popularity authentication era it makes use of layout of veins procured through passing near-infrared mild thru the finger to carry out identity and it recognizes and captures one finger print and use to realize on every occasion in want blood waft withinside the veins for the duration of popularity make certain the man or woman is alive and real, in preference of a fraudster or a lifeless individual through this software program era. This paper offers an statistics at finger vein popularity subject matter for any individual who reads it even while not having approximate knowledge about it

Key words: - Biometrics, finger vein recognition,

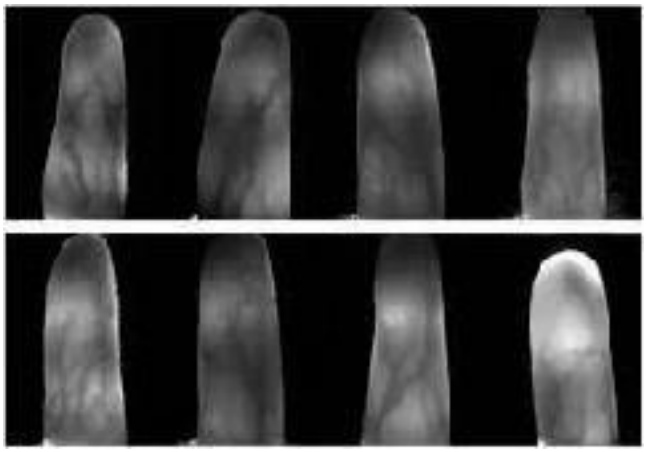
1. INTRODUCTION

As discussed above the number of activities in internet has been increasing and authentication of single users is required so in order to this the biometric concept is used. Biometric refers to verification or identification of a person by his/her uniqueness which can be identified by so many biological traits. Which includes retina patterns, voice, signatures, palm recognition, face recognition, iris scan and finger vein recognition. When compared to all finger vein recognition has high Accuracy, Speed and Secured. Finger vein recognition overcomes all other biometric traits, this consists of finger prints of that particular person as well as finger veins. Vein image is perfectly captured by Infra-red light

This light is observed by the hemoglobin and the vein pattern appears darker.
Benefits of it are:

1) Finger veins are hard to copy and duplicate
2) It uses a very small device around [1,3]
3) It will remain unchanged regardless of their age
4) There is no negative impact on human health
5) It is difficult to change even by surgeries
6) Even twins' vein does not match

After capturing the vein Image, it is extracted from the voice and voice reduction and normalization is done. More vein patterns are captured extracted and preserved. To capture and extract the finger vein several methods are used

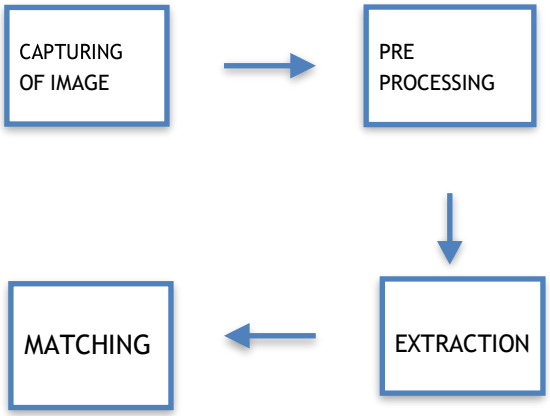


COMPARISON OF BIOMETRIC TECH

BIO METRICS	ACCURACY	SECURITY	SIZE
FINGER VEIN	HIGH	HIGH	HIGH
RETINA	HIGH	MEDIUM	SMALL
SIGNATRE	MEDIUM	LOW	MEDIUM
VOICE RECOGNIS	LOW	LOW	SMALL
FACIAL RECOGNIS	LOW	LOW	LOW

2. STEPS INVOLVED

1) Capturing of Image
2) Image Pre Processing
3) Extraction of the finger vein for future needs
4) Matching and recognizing



CAPTURING OF IMAGE

The finger veins are captured using infrared (IR) the light passes through the fingers and extracts the exact finger vein image it captures the complete finger even backside, l i g h t travels throughout the finger.
Two methods used to capture the vein images are:

1) Reflection of light
2) Transmission of light

Reflection of light
In this case of reflection of light, it captures only one side of the finger and captures on the surface of the finger.

Transmission of light
In this case of transmission of light, the light passes through the finger and captures the entire finger veins.

The data is collected from public finger vein database called SDUMLA-HMT from a typical database, while capturing theycapture the images of both the hands so that maximum 150 sample images are captured and stored in "jpg" image file in a grayscale format with 320*240pixels

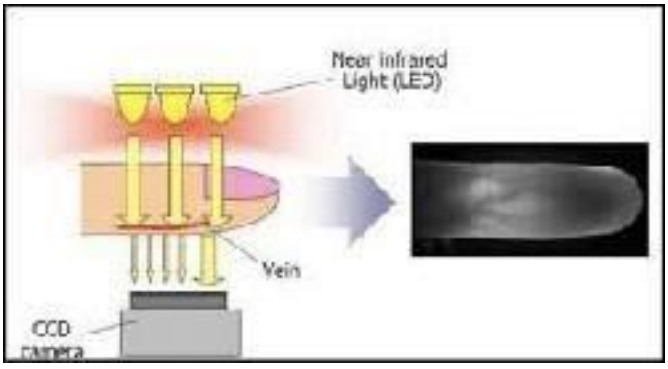


IMAGE PRE PROCESSING

The next step after capturing of image is Image preprocessingthe captured images are noisy low contrast and translational and rotational variations
The sub methods of image preprocessing are: -

1) Grey scale color conversion
2) Equalization of histogram
3) Filter of grey scale median
4) Detection of finger
5) binarization of captured image
6) Thinning of image

Firstly, in preprocessing image is grey scale conversion. The image in the RGB format is converted to Grey scale imageand reduces to 3 bytes it cause less memory space in theboard, Filter of grey scale median is used to Smoothen the noise, the technique binarization converts the Image into black pixel value
(0) and white pixel value (255). The last method thinning binds the binarization value.

EXTRACTION OF FINGER VEIN FOR FEATURE NEEDS

This extraction extends to two information that is

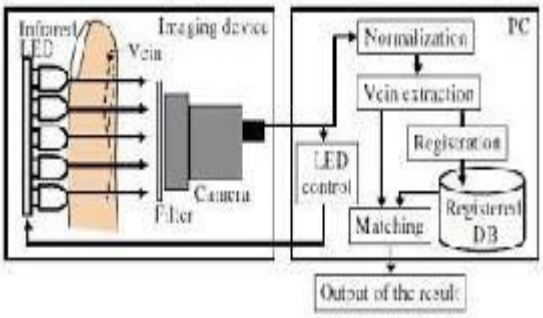
1) Topological information
2) Curvature information

In topological information the finger veins are stored in topological form so that all information connected to each other and shares the information in between so whenever the user access all they will detect easily and reacts very fast

In curvature information it is totally opposite to the topological information it acts as a solo reactor it reacts the assessor whenever the user is authorized
Totally both information In some other Manner it identifies and recognizes the user

MATCHING AND RECOGNISING

By above methods it calculates overall formulas and algorithms and recognizes the users and it allows them toaccess and get works done, it will keep all the records of loginand logout and detects the unauthorizedusers



Above image shows the process of how the finger veins are captured and recognized

3. APPLICATIONS

Finger vein methods and techniques are used in so many fields as a password, security and in other fields too, in each and every Aadhar card the finger prints of the person is added in case of theft, missing complaints or any crime they will first identify and check it by finger print this is one of the best evidence and clue for forensic department

1. Credit card authentication
2. Employee attendance
3. Time tracking
4. Automobile security
5. Home locks
6. Forensics identification

4.ADVANTAGES

1. Compared to all other biometrics it carries out several advantages and most used technique with less time and high secured
2. Vein patterns are inside the skin, so damage on outside does not affect recognition
3. Duplicate to copy
4. Very easy to use
5. Unique concept

5..LIMITATIONS

1. It is constant from age 20-50 yrs, younger and older people's needs to replace their veins
2. It is affected by environmental changes such low temperature, raise blood pressure

6. CONCLUSIONS

The paper reported on research Shows and gives information about the finger vein recognition and identification and a detailed information about how the image is captured andrecognized step by step which is later used in so many applications. In future finger veins will be used in each and every platform and the future updates on finger vein should be done limitations should overcome this will one of the most advanced techniques

7 . REFERENCES

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