

USING MATLAB BASED SIMULATION IN ORDER TO IMPLEMENT BIOMETRIC SECURITY PALM PRINT RECOGNITION

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Abstract

Palm print recognition is biometrics [1] of eligible at present time. Biometric system are used to authenticate identity by measuring behavioral & physiological feature. So, main two kinds of biometrics are physiological and/or behavioral [16]. The print patterns are always unique it is a reliable fact. Palm print is create up of principal lines, wrinkles & ridges. Palm print verification uses these features to verify identity of a person. Here in this research we have made reduced the time taken during biometric comparison using edge detection mechanism. We have also made the security stronger using three dimensional security system .Here we would simulate 3d security system using MATLAB simulation environment.

1. INTRODUCTION

Palm print recognition has one of biometrics available at present. Biometric systems are used to confirm identity by measuring physiological and/or behavioral characteristics. So, two main categories of biometrics are physiological. **Physiological category** includes physical human traits like palm print, hand shape, eyes, veins, etc. **The behavioral approach** includes movement of human, like hand gesture, speaking styles, signature etc.

We are discussing Physiological category palm print. So the discussion about behavior approach does not make any sense.

A system of biometric might be used for personal identification instead of based on token methods like a passport, a physical key & an ID card or Knowledge base method like password. Token could be lost at list while knowledge could be forgotten within a knowledge-base in token-based.

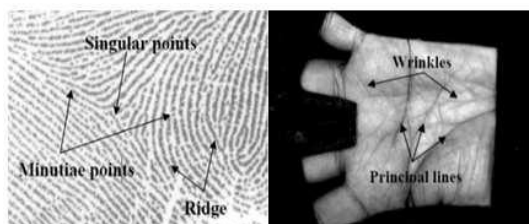


Fig 1 Palm print features

A palm print means to acquire image of palm region of hand. It could be either an image online or off line image where image is taken with paper & ink.

The palm itself consists of principal lines, & epidermal ridges. It differs to a fingerprint^[19] within that it also contains other information like texture, indents & marks which could be used at time of comparison of one palm to another.

Palm prints are used to many work for criminal, forensic, or commercial applications. Palm prints, are often found at crime scenes as result of offender's gloves slipping during commission of crime, & thus exposing part of unprotected hand.



Fig 2. Palm Print

Biometrics technology is used for identifying uniquely human system by means of measuring & analyzing more intrinsic behavioral or physical traits^[1]. This human body feature consists of fingerprints, eye retinas & irises^[2], facial patterns & hand measurements. Biometric systems consist of applications making use of biometric technologies & that allow identification automatically, verification of a person. Processing of personal data consist of use of a biometric system is known by privacy experts to be only necessary within places hard upper level of strict & security identification procedures.



Fig 3 print in PC

2. BENEFITS OF ADOPTING PALMPRINT

1. **No urgent & need to Remember Passwords:**
Because it client our biometry we have not need to give any password.
2. **Unauthorized to Personal Data Can be Denied:** It is a security system that no one could hack it as they are not having our fingerprint, voice, face etc.
3. **Use to ATMs, Credit Cards Can be Prevented:**
None could use our ATM just by knowing our PIN. Because no number or no password is there.

3. OBJECTIVE OF THE RESEARCH

Palm print is used in personal identification for a precise & robust recognition. Palmprint recognition had been reconnoitered over several years. During this time, Many glitches that are related to palmprint recognition have been addressed. Most of studies has been done within palmprint recognition due to stability selective & reliability. It has been used for law enforcement, civil applications etc. various Researchers have proposed a many type of palm print preprocessing, feature extraction & matching methods.

1. In this research we have enhance the security using three dimensional palm print. One can stole or capture some ones palm print by trick. But it is not possible for crackers to crack the multidimensional biometric sample.
2. In this research one would scan his palm two times from different dimensions.
3. In this Work we have reduced the time consumption of comparison using edge detection mechanism.
4. The biometric sample usually takes a huge space also. We store only edge based biometric sample this will also save the space.

4. TOOLS AND TECHNOLOGY

This Research Work using MATLAB software environment for proposed work within video steganography, MATLAB is a computing surroundings of numerical & 4th generation programming language. Residential by Math Works, MATLAB also used to matrix manipulations. It allows plotting of data implementation of algorithms, creation of user interfaces, & interfacing with programs written within other languages. It make into whole computation, visualization, & programming within an easy-to-use in a natural world where problems & solutions are expressed within impertinently mathematical notation.

5. PROPOSED ALGO

1. Get file name from edit1 and store in x1
2. Get edges from x to t
3. Get edge from x1 to t1
4. Read file f+ record no.jpg
5. Read file ff+ record no.jpg
6. Start timer to read starting time for comparison
7. Compare images (x and xr) and store the matching percentage in rrr1

8. Compare image (x1 and yr) and store the matching percentage in rrr2
9. Stop timer and read time taken in x
10. Display time taken
11. Display matching percentage in rrr1
12. Display matching percentage in rrr2
13. Read the state of file f+ record no.
14. Read file size from state of file f+ record no.
15. Read the state of file ff+ record no.
16. Read file size from state of file ff+ record no.

Time Complexity: Objective is to reduce time taken during comparison of Biometric Data.

Space Complexity: Second Objective is to reduce space Taken by Sample size.

Traditional two Dimensional implementation

In Traditional 2d Biometric comparison 2 dimensional data was captured & Comparison of sample were made.

Advantage:

Only single biometric sample were stored so data took less space

Limitation :

The security was less in case of traditional 2d Biometric implementation

Traditional Three Dimensional Implementation

In Traditional 3d Biometric comparison of multiple 2 dimensional data was captured & Comparison of sample was made.

Advantage:

The security was more as compared to traditional 2d Biometric implementation

Limitation:

Multiple biometric samples were stored so data took more space compared to traditional 2d Biometric implementation.

As number of sample increased so time consumption to compare data also increased.

Proposed Three Dimensional Implementation

In proposed 3d Biometric^[7] comparison of multiple 2 dimensional data was captured & Comparison of sample was made.

Advantage:

- The security was more as compared to traditional 2d Biometric implementation.
- It takes less space as compare to traditional 3d biometric implementation as samples are taken in form of edges.
- It takes less time as compare to traditional 3d biometric implementation as samples are taken in form of edges.

	Traditional	Proposed
Sample 1	4.85893	5.02431
Sample 2	4.51895	3.49762
Time taken	0.0597542	0.0164728
File Size	13262	6977

6.RESULT AND DISCUSSION

Image Processing Using Edge Detection Mechanism In Matlab

In Matlab we have used canny based edge detection to find edges of palm as it is consider good than other edge detection mechanisms.

```
im=imread('1.jpg');
imagesc(im);
```

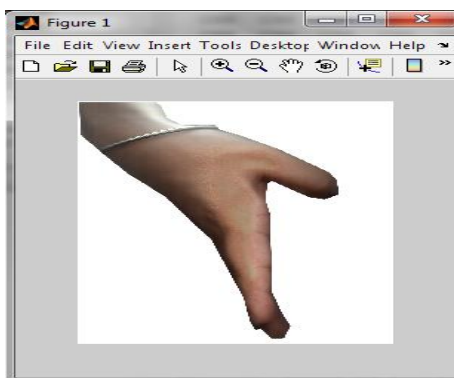


Fig. 4: Existing Image(1.jpg)

```
im=imread('1.jpg');
img=rgb2gray(im);
sob_im=edge(img,'sobel');
figure(2);
imagesc(sob_im);
axis('square');
colormap('gray');
```

```
imshow(sob_im);
```

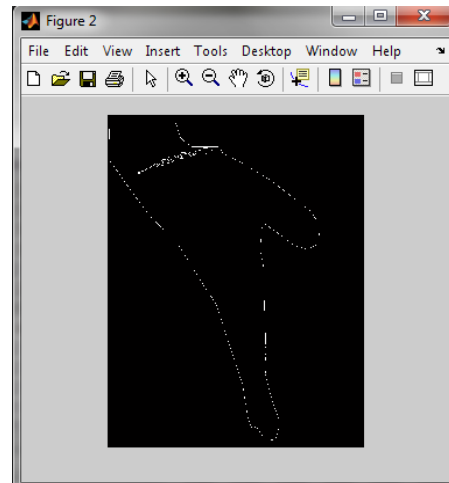


Fig. 5: Image(1.jpg) After Applying Sobel Operator Based Matlab Code

```
im=imread('2.jpg');
imagesc(im);
```



Fig. 6: Existing Image(2.jpg)

```
im=imread('2.jpg');
img=rgb2gray(im);
sob_im=edge(img,'sobel');
figure(2);
imagesc(sob_im);
axis('square');
colormap('gray');
imshow(sob_im);
```

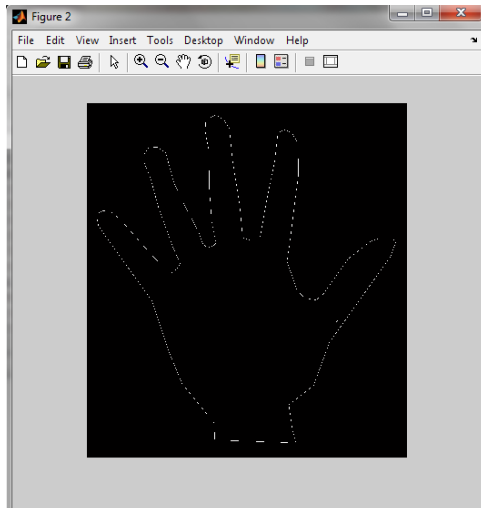


Fig. 7: Image(2.jpg) Applying Sobel Operator Based Matlab Code Design View Of 3D Based Biometric Comparison

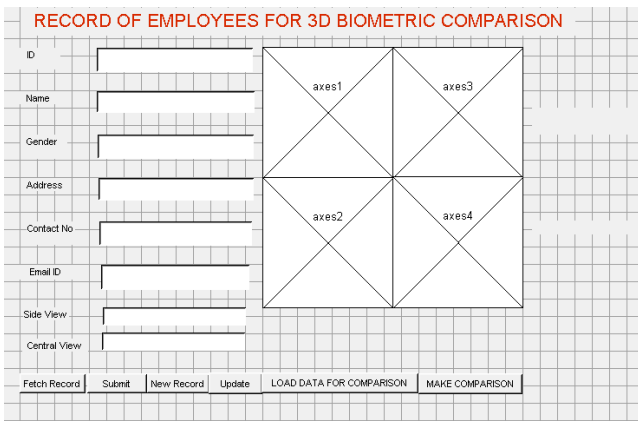


Fig.8: Design View Of 3D Based Biometric Comparison

To make comparison type side view and central view image name and load data for comparison

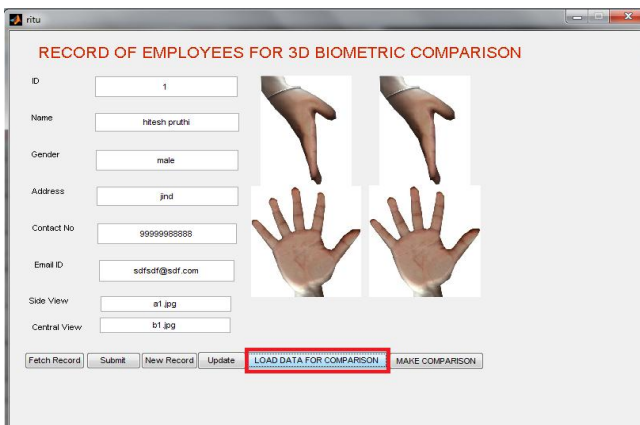


Fig. 9: Loading Of Images For Comparison

Then click on make comparison. If biometric sample matches then matched would be displayed and if unmatched then unmatched would be displayed.

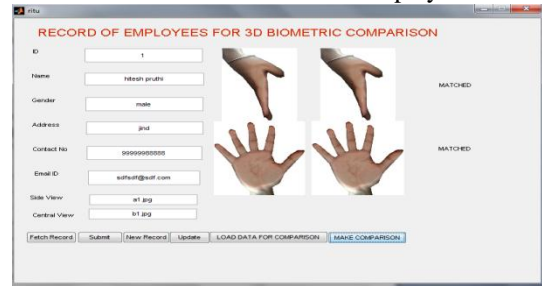


Fig. 10: Comparison Of Images

6.CONCLUSION

During this instance of time, several different glitches related to palm print recognition have been addressed. Furthermost studies has been done in palm print recognition due to its stability, reliability & exclusivity. Furthermore, this has been employed for law enforcement, civil applications & access control applications. For 3 D recognition multidimensional data has been taken & complexity of algorithm increases as array of matrix are compared in such cases. It would increase accuracy but takes lot of time on rendered images. So we have extracted only useful part of biometric object such as pattern of palm in multidimensional form.

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