

Palm Vein Authentication

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Abstract: Nowadays Personal identification is one of the major problems in our society. The most common form of personal identification is usually involves a Personal Identification Number (PIN), password, and an ID card etc. Consequently there is a problem faced by people by loosing, stealing and sharing or even for getting the codes and cards. Biometric authentication has been widely accepted, safest and popular technique. The people prove their identity with unique biological characteristics such as fingerprint, iris, voice, face, gesture and hand geometry. Our approach is to design effective and secure contact less palm vein. Contact less design is more preferred as it offers more hygienic one. Our palm vein authentication system uses the vascular vein patterns as a personal identification factor which provides contact less and a very high level of accuracy. The proposed technology uses user's palm vein pattern to ensure security and authentication of user information.

Keywords: Palm vein; Personal Identification Number (PIN); Authentication and SIFT algorithm

I. INTRODUCTION

Authentication is a process of verifying the identity of a person or device. Since authentication is essential for an effective security system. The normal process of identifying an individual was based on a username and password. In a security based system, authentication is a process of giving individuals access to the system objects based on their personal identity. Authentication is important because it enables organizations to keep their networks secure by permitting only authenticated users to access its protected resources, which may include computers, networks, databases, websites and other network-based applications or services.

The most common forms of personal identification usually involve a Personal Identification Number (PIN), password and an ID card etc. Consequently there is a problem faced by a people by loosing, stealing and sharing

or even forgetting the codes and cards [2]. To overcome these shortfalls of existing traditional mechanism.

Biometric authentication has been widely accepted, safest and popular technique. The people prove their identity with unique biological characteristic such as voice, face, iris, fingerprint, gesture and hand geometry. The people will always have it with them and they cannot transfer these to others. Contactless design is more preferred as it offers more hygiene. However the face can be obstructed by hair, glasses, hats and also facial characteristics can vary according to lighting condition are view points, which cause performance degradation in real world applications. Fingerprint and palm print recognition is also a widely used identification techniques but it requires contact acquisition mode such as sensor [3]. Our palm vein authentication system uses the vascular vein pattern as a personal identification factor which provides contactless and a very high level of accuracy and it is hard to forge [8].

In our system, we provide a new idea for securing personal information which provides a spoof of security. The chances to implement the palm vein authentication system span a wide range of applications including security systems, banking sectors [7], educational facilities and commercial enterprises.



1. Something you know
(such as a password)



2. Something you are
(such as a fingerprint)



3. Something you have
(such as a smart card)

Fig 1. Base Diagram

II. OBJECTIVES

The objective of our approach is to investigate an effective and secured palm vein type authentication using



SIFT algorithm and its application to the prohibited area. Our main contributions are:

- To develop an effective and secured authentication system using palm vein vascular pattern.
- For developing a low cost palm vein capturing device.
- To Use SIFT algorithm for palm vein authentication.
- To evaluate our approach is using self-recorded database.



Fig 2. Palm Image

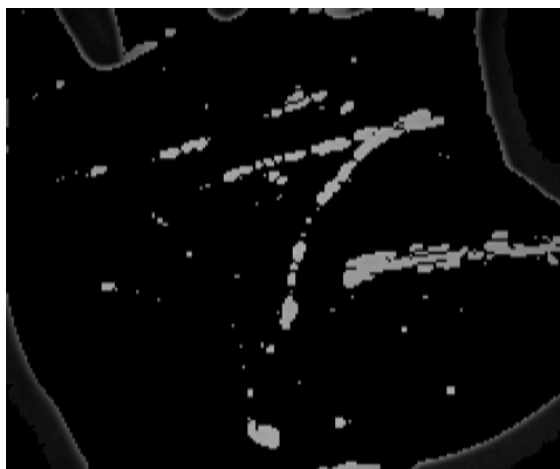


Fig 3. Palm Vein Image

III. EXISTING WORK

The overview of the Personal Authentication system is a very helpful to identify them person identity. A Fingerprint system is used in that system. The Fingerprint sensor is used to detect whether the identity is correct or not. Nowadays fingerprints are easily cracked using silica gel but also it requires contact Authentication.

IV. METHODOLOGY

The proposed work is carried out using Openmv3 cam m7. This methodology is organized in two processes. One is in enrollment process and other one is in verification process. In enrollment process, one must enroll his/her

personal identity for further assessing the system or service. In verification process, the user presents the palm image. Using SIFT algorithms the palm vascular patterns are extracted.

V. PROPOSED WORK

The proposed design consists of two processes. One is enrollment process and other one is verification process. Fig.4 and Fig.5 Clearly explained about these two processes.

A. Enrollment Process

In enrollment process, one must enrol his / her personal identity for further assessing the system or service. In this approach the user's palm vein image is captured using openmv3camM7 and NIR array. The user's skin tone is detected by skin tone detection and the palm vein vascular patterns are extracted using SIFT algorithm. The extracted vascular key points are made inside the user's skin tone for an effective a highly secured authentication and this forms the stego image. Finally user's personal data will be stored in the database. This database information's will help to identify the correct person. In this method users palm vein stenographic images stored in the database. During the time of processing one particular person's palm vein image will be compared with this database information.

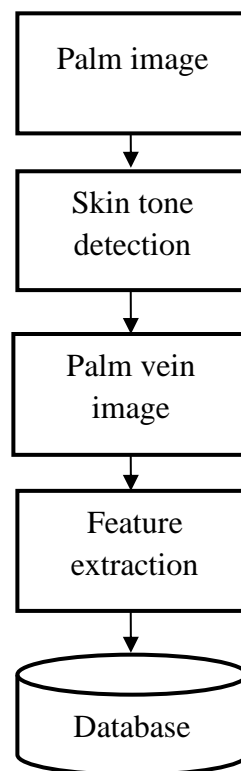


Fig 4. Block diagram of the Enrollment process

B. Verification Process

In the verification process, the user palm image was verified with stored database. Using SIFT algorithm, the palm vein vascular patterns are extracted. Now the stego



image of the current user is called from the database and vascular key points are extracted. The matching unit compares whether the extracted key points of the user who came for verification exists in the same skin tone (stego image). If the vascular key point of the current user and the stego image in the database matches, there exists an Authentication which is genuine otherwise impostor.

The complete verification process is shown in Fig.5. Here user's data will be matched with database data. If both data are matched authentication process will success otherwise authentication will be failed. This will be used in E-banking and financial sectors. This method is more secured than other authentication methods.

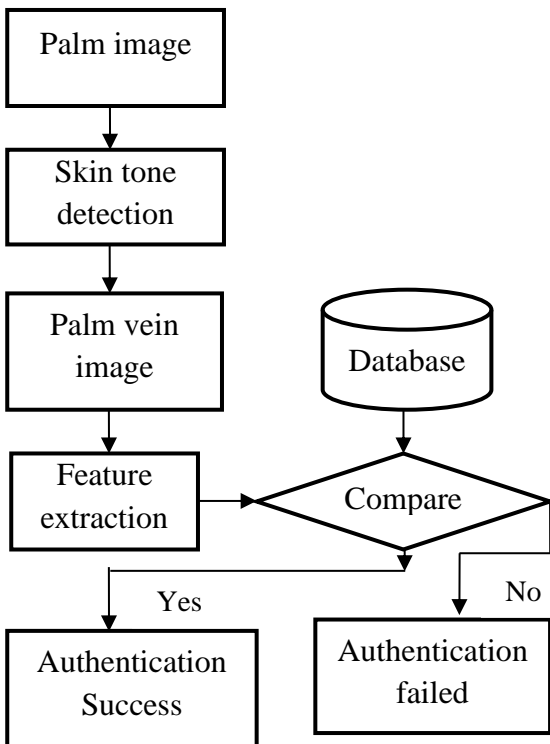


Fig 5. Block diagram of the Verification process

C. Hardware Setup For The Propose Work:

In this proposed work both hardware and software play major role. Fig.6 clearly shows the simulation result of the proposed work. In that you can able to see the verification process of user's palm image.

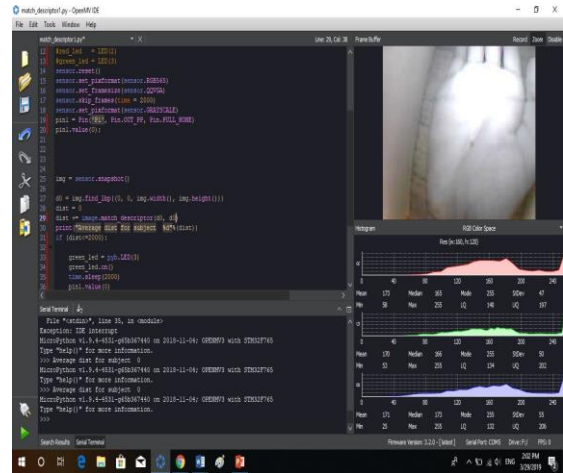


Fig 6. Simulation Authentication

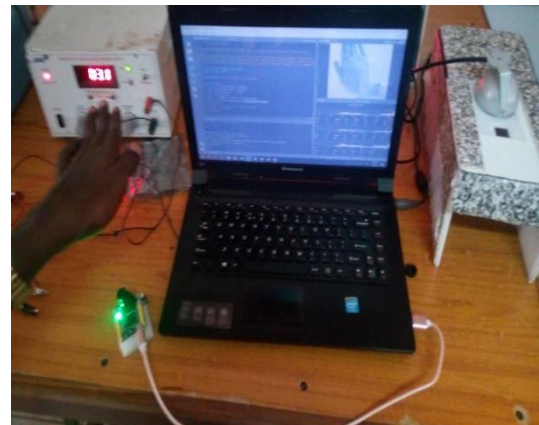


Fig 7. Features match in hardware tool

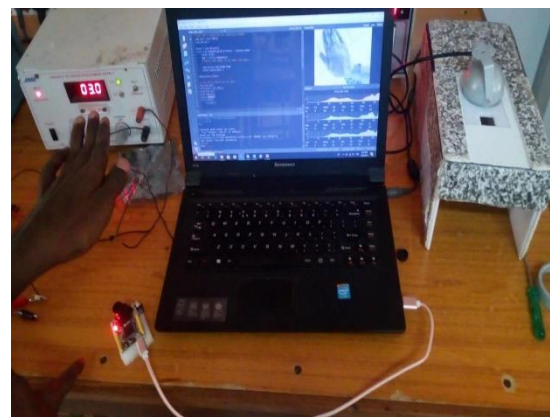


Fig 8. Features mismatch in hardware tool

VI. CONCLUSION

The advancement in science and technology is a persistent process. Latest gadgets and latest technology are being designed and developed. Security and Authentication of individuals is necessary for our daily lives. In this project, palm vein patterns are used as a personal identification factor which provides contactless

and a very high level of accuracy and it's very hard to forge. Thus palm vein technology can be used in E-banking and financial sectors.

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