A

Seminar report

On

PALM VEIN TECHNOLOGY

Submitted in partial fulfillment of the requirement for the award of degree
Of Electronics

SUBMITTED TO: **SUBMITTED BY:**

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Preface

I have made this report file on the topic **PALM VEIN TECHNOLOGY ,** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to …………..who assisting me throughout the prepration of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

Acknowledgement

I would like to thank respected Mr…….. and Mr. ……..for giving me such a wonderful opportunity to expand my knowledge for my own branch and giving me guidelines to present a seminar report. It helped me a lot to realize of what we study for.

Secondly, I would like to thank my parents who patiently helped me as i went through my work and helped to modify and eliminate some of the irrelevant or un-necessary stuffs.

Thirdly, I would like to thank my friends who helped me to make my work more organized and well-stacked till the end.

Next, I would thank Microsoft for developing such a wonderful tool like MS Word. It helped my work a lot to remain error-free.

Last but clearly not the least, I would thank The Almighty for giving me strength to complete my report on time.

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ABSTRACT

With the increase in technology threat to personal data and national security had also increased .The methods that were developed to secure important information from outside intervention were not up to safe mark .There was a need to introduce a technology that secures our data more efficiently from unlawful intervention .

Fujitsu has developed a palm vein pattern authentication technology that uses vescular patterns as personal identification data .Vein recognition technology is secure because the authentication data exists inside the body and is therefore very difficult to forge. It is highly accurate. This technology can be used in various fields like banking, hospitals, government offices, in passport issuing etc. Business growth will be achieved with these solutions by reducing the size of the palm vein sensor and shortening the authentication time. This paper is about the palm vein technology, its applications, how this technology is applied in real time applications and the advantages of using this technology.

Introduction:

In the ubiquitous network society, where individuals can easily access their information any time and anywhere, people are also faced with the risk that others can easily access the same information anytime and anywhere. Because of this risk, personal identification technology is used which includes Passwords, personal identification numbers and identification cards.

However, cards can be stolen and passwords and numbers can be guessed or forgotten. To solve these problems, Fujitsu developed four methods:fingerprints, faces, voice prints and palm veins. Among these, because of its high accuracy, contact less palm vein authentication technology is being incorporated into various financial solution products for use in public places. This paper palm vein authentication technologies and some examples of its application to financial solutions.

Palm Vein Technology Reviews:

The Basis of Palm Vein Technology

fig:3.1 veins in palm

An individual first rests his wrist, and on some devices, the middle of his fingers, on the sensor's supports such that the palm is held centimeters above the device's scanner, which flashes a near-infrared ray on the palm. Unlike the skin, through which near-infrared light passes deoxygenated hemoglobin in the blood flowing through the veins absorbs near-infrared rays, illuminating the hemoglobin, causing it to be visible to the scanner. Arteries and capillaries, whose blood contains oxygenated hemoglobin, which does not absorb near-infrared light, are invisible to the sensor. The still image captured by the camera, which phot

ographs in the near-infrared range, appears as a black network, reflecting the palm's vein pattern against the lighter background of the palm.

An individual's palm vein image is converted by algorithms into data points, which is then compressed, encrypted, and stored by the software and registered along with the other details in his profile as a reference for future comparison. Then, each time a person logs in attempting to gain access by a palm scan to a particular bank account or secured entryway, etc., the newly captured image is likewise processed and compared to the registered one or to the bank of stored files for verification, all in a period of seconds. Numbers and positions of veins and their crossing points are all compared and, depending on verification, the person is either granted or denied access.

REGISTERING THROUGH PALM VEIN TECHNOLOGY

Step 1:

Palm vein authentication technology consists of a small   Fig3.2 Scanner Display
Palm vein scanner that's easy and natural to use, fast and
Highly accurate . Simply hold your palm a few centimeters
Over the scanner and within a second it   reads your unique
vein pattern.A vein picture is taken and palm pattern is
registered.

Step 2:

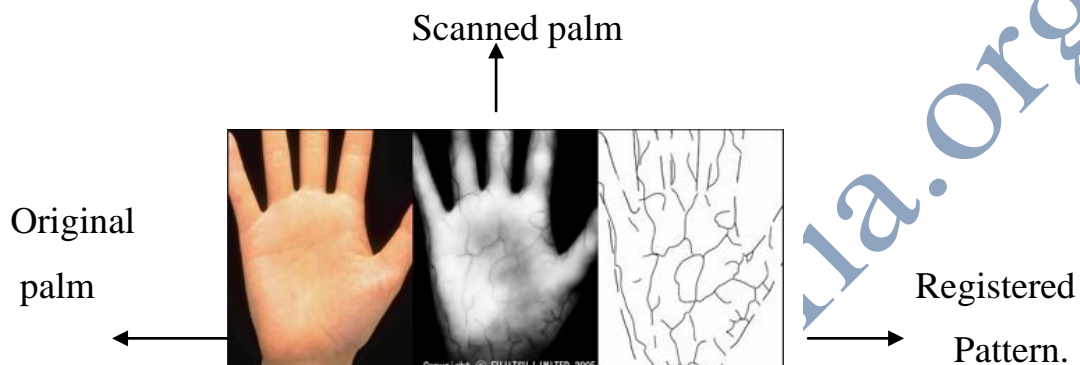Scanned palm

Original
palm

Registered
Pattern.

Fig 3.2: Process of Registration

The registered palm pattern is stored into the database along with the personal details
of the client.

Working of palm vein security systems

→ One should place his/her palm
near to scanner.

→ 2. The scanner makes use of a special
characteristic of the reduced hemoglobin
coursing through the palm veins — it absorbs
near-infrared light. This makes it possible to
take a snapshot of what's beneath the outer
skin, something very hard to read or steal.

Fig 3.3.1:Infra red on Palm

→ 3. The integrated optical system in the palm vein
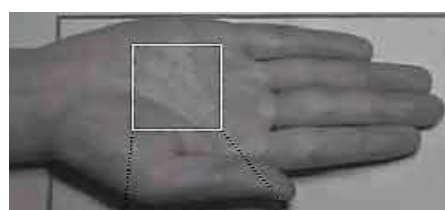
sensor uses this phenomenon to generate an   Fig 3.3.2: Short region on palm

image of the palm vein pattern and the generated

image is digitized, encrypted and finally stored

as a registered template in the database.

How Secure is the Technology ?

On the basis of testing the technology on more than 70,000 individuals , Fujitsu declared that the new system had a false rejection rate of 0.01% (i.e., only one out of 10,000 scans were incorrect denials for access), and a false acceptance rate of less than 0.00008% (i.e., incorrect approval   for access in one in over a million scans). Also, if your profile is registered with your right hand, don't log in with your left - the patterns of an individual's two hands differ. And if you registered your profile as a child , it'll still be recognized as you grow, as an individual's patterns of veins are established in utero (before birth). No two people in the world share a   palm vein pattern - even those of identical twins differ . In addition the devices ability to perform personal authentication was verified using the following:

➡ Data from people ranging from 6 to 85 years old including people in various occupations in accordance with the demographics realized by the Statistics Center of theStatistics Bureau.

➡ 2. Data about foreigners living in Japan in accordance with the world demographics released by the unitednations.

➡ 3. Data taken in various situations in daily life including gafter drinking alcohol, taking a bath, going outside and waking up.

What happens if the registered palm gets damaged?

There may be a chance that the palm we had registered may get damaged then we cannot use this technology,so during the time of registration we take the veins of both the hands so that if one gets damaged we can access through the second hand. When hand get damaged upto large extent we can get veins because deeper into the hand veins are obtained.

Fig 3.5: Registering two palms

When we apply this method we can maintain complete privacy .

Contact less palm vein authentication device
(HYGIENE CONCERN):

The completely contactless   feature of this Device makes it suitable for use   where high   levels of hygiene are required .It also eliminates any   hesitation people might have about coming into contact with something that other people have already touched.

Fig:3.6 Contact less sensor

In addition to being contactless and thereby hygienic and user-friendly in that the user does not need to physically touch a surface and is free of such hygiene concerns, palm vein authentication is highly secure in that the veins are internal to the body and carry a wealth of information, thereby being extremely difficult to forge.

ADVANTAGES

In addition to the palm, vein authentication can be done using the vascular pattern on the back of a hand or a finger. However, the palm vein pattern is the most complex and covers the widest area, Because the palm has no hair, it is easier to photograph its vascular pattern. The palm also has no significant variations in skin color compared with fingers or back of the hand, where the color can darken in certain areas.

DISADVANTAGES

- There are numerous factors that can affect the quality of the captured image such as body temperature, humidity, heat radiation, nearness of vein to surface, camera calibration and focus.
- It is still relatively expensive and not available for mass production yet.

APPLICATIONS :

This palm vein authentication technology is used in various areas for more security. The following are some of the important areas where it is used:

ATM:

In July 2004, to ensure customer security, Suruga bank launched its "Bio Security Deposit" the world's first financial service to use Palm Secure . This service features high security for customers using vein authentication , does not require a bank card or pass book and prevents withdrawals from branches other than the registered branch and ATMs thereby minimizing the risk of fraudulent withdrawals. To open a Bio-Security Deposit account, customers go to a bank and have their palm veins photographed at the counter in order to guarantee secure data management, the palm vein data is stored only on the vein data base server at the branch office where the account is opened..

In October 2004, The Bank of Tokyo launched its "Super –IC Card". This card combines the functions of a bankcard, credit card, electronic money and palm vein authentication. This Super –IC Card contains the customers palm Vein data and vein authentication algorithms and performs vein authentication by itself . This system is advantageous because the customers information is not stored at the bank. When a customer applies for a Super –IC Card, the bank sends the card to the customers home . To activate the palm vein authentication customer brings the card and his passbook and seal to the bank counter where the customers vein information is registered on

Fig:5.1 ATM Sensor

the card . After registration the customer can make transactions at that branch counter and ATM using palm vein authentication and a matching PIN number

PERSONAL COMPUTERS:

In personal computers palm vein technology

can applied by inserting the vein sensor inside mouse.
when power is supplied to system the mouse also gets
power and the sensor in the mouse will be ready to sense
palm veins. When one place his/her palm the sensor sense
the veins and if they are matched with the registered ones   Fig:5.2 PC Sensor
the system allows the person to use it.

One can use this technology even to lock folders , that should be
maintained as private information.

IN HOSPITALS AND LIBRARYS:

A public library in Japan is set to
become the first in the world to use palm-vein biometrics
as a substitute for conventional library cards.

The University of Tokyo hospital   Fig:5.3 Using Sensor
has taken delivery of a contactless palm vein authentication system to secure physical
access to its Department of Planning, Information and Management.

Authentication:

In front of our homes we can apply
this Palm vein techonolgy so that by registering the veins
of our family members and relatives we can maintain high
range security which is not possible through other
technologies . Japanese recently used this technologies
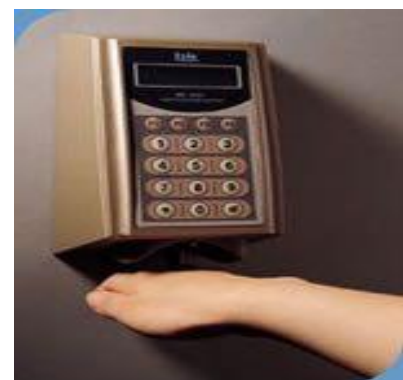before front doors and getting high range security.

Fig:5.4 Near Front Doors

Conclusion

Palm vein pattern authentication technology developed by Fujitsu was being used in a wide range in japan . If this technology is introduced in our country we can solve many problems such as password protection in ATM ,security in various fields and if we implement this technology in government officeswe can make the employees to work according the government timings.surely this technology will bring a revolution in the field of science and technology in the near future.

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