A Vein Map Technology in Combination with Kerberos Authentication Protocol

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Abstract: *In the twenty first era the protection of data or information has become a very critical subject. There is increasing demand from every private as well as government agencies for the stronger authentication system that will be difficult to breach. So the idea of biometric authentication came into picture. There are various types of biometric authentication that are used over the times, such as finger print recognition, facial recognition, retina scanning and iris scanning. These biometrics all found with the different flaws. So the vein map technology came into existence. The vein map technology uses sensors that are only able to recognize vein patterns, if hemoglobin is actively flowing through the person's veins. More over each person's vein map is unique, no two person in the world can have the same vein map. For additional security purpose we can combine vein map technology with the Kerberos authentication protocol. The use of such a unique biometrics in combination with encryption of that biometric along with different registration server and authentication server the system will be very difficult to breach.*

Keywords: Vein map technology, Authentication Protocol, Biometric, Kerberos, Token Granting.

1. Introduction

Biometric is the technology of identifying people by using different human behavioral or physiological attributes like iris, voice, fingerprint, or face detection [1]. Since, lots of unique information is stored on a hand and it is easy to retrieve information, hand based biometrics like signature, palm print, fingerprint are the most popularly used biometric technologies.

Even if we are having long list of biometric identification patterns none of the biometric is perfectly secure and reliable to use. For example, Fingerprint has been used for authentication from many years since it is easy to handle authentication device, it is the most mature biometric pattern which used in many applications. But the fact is that fingerprint based biometric authentication system is susceptible to fake because the fingerprints can be easily captured by the others. Further, sometime finger's surface can be affected by sweat and dryness and it disallow system to capture proper pattern of finger [6]. These can minimize the performance of the system. Like this voice signature, iris images, hand shapes are easily forged; Face recognition is also difficult due to face-lifts or occlusion [2],[3]; and biometric, like iris recognition, signature are suspected to spoofing attacks that is this biometric identifiers can be copied easily and are used to create artifacts , by this many available biometric devices can be deceive.

The challenge before biometric technology is to minimize the performance of recognition in terms of efficiency as well as Accuracy. Until now, most of the technical researchers have implemented methods for improve security, reliability. At the same time there exist, hopefully insuperable and very complicated challenge for those who wish to bypass them [5]. Biometric authentication mechanism needs to be cost effective for consumer electronic application [4].

To take over the limitations of current biometric system, new advance biometric system has been invented called finger vein recognition which is more secure and efficient pattern of authentication. It is proved scientifically that each figure has unique vein pattern so we can use it as personal identification [7]. Finger vein has several advantages over other available biometric traits. Like, as vein is hidden inside the human body it is almost impossible to steal or forge finger vein. It is very hard to make duplicate pattern of vein because of its complex internal pattern and uncommonness. Condition of Skin does not affect the pattern of vein like palm or finger print pattern.

Now the second part of the paper is the Kerberos authentication protocol. It provides a secure way of communication among the client and the server. The Kerberos protocol depends heavily on associate authentication technique involving shared secrets. The basic conception is sort of simple: If a secret is thought by solely 2 individuals, then either person will verify the identity of the opposite by confirming that the opposite person knows the key. The combination of this unique vein map technology with the help of Kerberos as a biometric identification will be very unique concept in itself.

2. Literature Review

Initially iris scan is used for authentication in 2005 at Canadian airport to authenticate pilots and workers at airport. But first people scare for scanning their eye iris regularly, they were worried about damaging of eyes due to scanning, they thought it will make negative effect on their vision, but now technology is improved and system is modified, so this problem is solved and there is no possibility of damage of eyes due to such scan. This system used in Canada called as CANPASS – Air.

T. Abdul-Hadi and Dr.Mohammad N. Abdullah [8] studied to resolve a secured communication between the mobile-

bank application server and shoppers using Kerberos protocol. Where they will use itinerant to confidently access their bank accounts, credit and deposit payments, and check for current account balances

Shangling Song and Zhi Liu [9] have successfully implemented vein map methodology in the mobile phones. Expected system takes about on an average 0.7 seconds to identify one input finger vein sample related degreed achieves an equal error rate (EER) of 0.07% on information of a hundreds subjects. The results of experiment reveal that the preplanned finger-vein pattern recognition system is capable for authentication on mobile devices.

In existing biometrics technologies like retina scanning, there are some flows like when we hold the retina printout of authorized person which is printed with ink jet printer by making hole at the center and hold it in front of the scanner, the system will authenticate this as authorize person by this way any one can access unauthorized information easily [10]. Face recognition is also very sensitive it checks for whether person is wearing cap, specks or any other jewelry that he had used at the time of setting facial password. So it is efficient to use vein map technology with combination of Kerberos authentication technology will make it more secure and convenient to use.

In this paper [11], It is not possible to give best result when we use Gabor Filter or Repeated line tracking methodology for authenticating finger vein. Identification of human being using repeated line tracking is mentioned before also but it requires best finger vein recognition system. Costlier is the only algorithm which is used for identification of human using finger vein.

Here in this paper they purposed modified human identification algorithm which uses finger vein for authentication of human. This system was based on and we proposed on automatic trimap generation, Gabor filter and repeated line tracking this will minimize the cost of device and also minimize the time for authentication.

In this paper [12], method that is employed to classification and review of textures is explained, relay on scale varied area measurements, developed by Benoit Mandelbrot for fractal objects. Even if the textures are not fractal for available range scale, the changes made in these measurements decided to be useful in identifying the texture. Information about frequency texture can be obtained.

In this paper [14], Finger print matching mechanism have been implemented , this mechanism utilize level three features, which with the evaluation of consumer electronics which is developing regularly, there is need to develop convenient and highly secured authentication model to protect private information mostly stored in mobile devices. While taking into consideration requirements for biometrics, security of information, where humans physiological or behavioral features are used for identification of individuals, has been extensively studied as a definite solution to security issues. Since, most of the existing biometric technologies have high time complexity or space complexity or both, and it is appropriate for mobile devices.

To improve the performance of finger vein authentication system new approach have been purposed in [15], This system uses finger print and finger vein pictures in very low resolution and combine this together. This can be accomplished by using combination strategies of a novel score level. By examining previously evaluated finger vein authentication strategies here [15] they develop new techniques that are superior than all of them. Development of two score levels holistic fusion and non holistic fusion to determine their effect in purposed system.

3. Proposed Work

We are proposing Kerberos as a combination of biometric plus additional authentication protocol. We can also call it as a biometric identification protocol. The technology we are using is vein map. The secret writing that is cryptography and biometric that is vein map with the registration server, authentication server and therefore the token granting server makes this system distinctive.

Kerberos has been eminent as authentication protocol. What we have a tendency to want to try and do is build it safer by desegregation it with a crypto biometric identification system that Kerberos implements. The user's actual biometric information is additionally not accessible with the authenticating server. It is solely submitted to the registration server. The cryptography and biometric that is vein map technology with the registration server, authentication server and therefore the token granting server makes this system distinctive. It will guard against most reasonably doable threats within the state of affairs. We have a tendency to beware of a) Biometric example security b) privacy of the user c) trust between user and authenticating server and d) network security connected problems.

The projected system follow task into 3 steps ::-
1) Registration
2) Authentication
3) Token Granting.

4. Conclusion

A vein map technology is extremely secure as a result of it uses info contained inside the body. It's additionally extremely correct as a result of the pattern of veins within the finger is advanced and distinctive to every individual. Moreover, the contactless feature provides it a hygiene advantage over alternative authentication technologies.

In personal computers vein technology will apply by inserting the vein sensing element within mouse. Once power is equipped to system the mouse additionally gets power and therefore the sensing element within the mouse are going to be able to sense palm veins. Once one place his/her finger the sensing element sense the veins and if they're matched with the registered ones the system permits the person to use it.

As many organization have Kerberos authentication protocol installed in their systems. So addition of the vein map technology will very much simpler. So this will be the new

development in the field of the security which will be accurate and complete.

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