



REVIEW ON SCOPE AND ENHANCEMENTS IN 3D BIOMETRICS

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ABSTRACT:- Biometrics means to related to human characteristics. Biometrics authentication (or realistic authentication has used to computer science as a form of identification & access control. It is also used to identify single in set that are under surveillance. Biometric identifiers are distinctive, measurable characteristics used to label & describe individuals.^[2] Biometric identifiers are often categorized as physiological versus behavioral characteristics.^[3] Physiological features are related to shape of body. Examples include, but are not limited to fingerprint, hand geometry, iris recognition, retina & odour/scent. 3D biometrics have potential to achieve better accuracy than its 2D counterpart by measuring geometry of rigid features on face. This avoids such pitfalls of 2D biometrics algorithms^[4] as change in lighting, different facial expressions, make-up & head orientation. Another approach is to use 3D model to improve accuracy of traditional image based recognition by transforming head into a known view. Additionally, most 3D scanners acquire both a 3D mesh & corresponding texture. This allows combining output of pure 3D matchers within more traditional 2D face recognition algorithms, thus yielding better performance.

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1. INTRODUCTION

Biometrics word make two word one is bio (life) & second is metric (to measure). The Bioscience methods that mechanize verification of some provide for his/her physiological or behavioral characteristics. This methodology of verification is most popular over traditional path including passwords & PIN numbers for its correctness & case sensitiveness.

system is to work out however a private is known. Reckoning on context, a biometric system shown in Figure one would be either a verification system or Associate in identification system.

Biometric system architecture

Biometric system architecture is representation of a system as a whole, including a mapping of functionality onto hardware & software mechanism a mapping of software architecture onto hardware architecture, & human interaction within these components. Different biometric recognition systems might have different set of sensors, sub-systems, algorithms, to achieve objective of specific pattern recognition & matching. They have be wrapping architecture of a biometric access control system for limited areas based single person finger print.

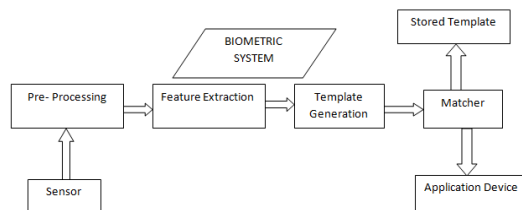


FIG 1 Biometric System

A biometric system should efficiently a plan recognition that make a personal recognition by vital legality of a important physiological or behavioral feature possessed by customer. These advantages are square measurable & distinctive. These characteristics mustn't be consistent. A vital problem in coming up within a sensible

Biometric verification needed comparing a registered or sign up biometric system against a latest captured biometric sample. The period of sign up as shown in a sample of biometric trait is captured. The processed by a laptop & stored for later comparison. This system would be recognition could be apply in verification mode, where biometric system recognize a human from entire sign up population by finding a



database for a match based only on this system. The complete database could be searched to confirm a someone has not applied for right pr under two different names. This is sometimes called one-to-many matching. A system could also be used in Verification Mode, where biometric system authenticates a person's claimed identity from their previously enrolled pattern. This is also called one-to-one matching. Though in a feasible biometric system the number of of other issues that should be care about involved.

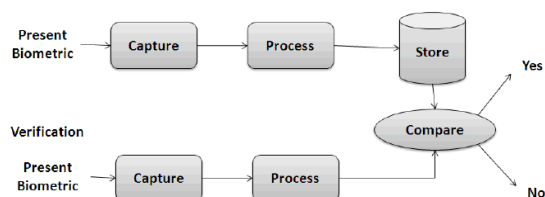


FIG 2 Biometric system architecture

1. Performance: Which refers to viable recognition truthfulness & speed, resources required to get desired recognition truthfulness & speed, as well as operational & environmental factors that affect accuracy & speed?
2. Acceptability: Which indicates extent to which people are willing to accept use of a particular biometric identifier in their daily lives.
3. Circumvention: This reflects how simple system could be fooled using fraudulent methods.

2. LITERATURE REVIEW

3D Fingerprint Phantoms DECEMBER, 2014 Sunpreet S. Arora, Kai Cao & Anil K. Jain

One of critical factors prior to deployment of any lbig range biometric system is to have a realistic estimate of its matching performance. In practice, evaluations are conducted on operational data to set an appropriate threshold on match scores before actual deployment. This system estimates, though, are restricted by amount of available test data. To overcome this limitation, use of a big data of 2D

synthetic fingerprints for evaluating fingerprint systems had been proposed.

THREE-DIMENSIONAL FACE & FINGER BIOMETRICS IN 2004 Kyong Chang, Damon Woodard, Patrick Flynn, Kevin Bowyer

The use of dense range scans of face to supplement or supplant visible-light images in face recognition systems have been a subject of recent interest in biometrics community^[25]. This paper summarizes recent research activities designed to assess potential of a high-resolution 3D face scan using a large database of such scans. We show that 3D faces offer potential for this application but also exhibit challenges that must be addressed before systems based on 3D face could be fielded. We also explain preliminary results from a study of 3D hand shape biometrics employing curvature classification of finger skin surface.

Biometric Authentication System based on 3D Facial Models IN MARCH 2015 Marijo Maracic

This paper presents structure of a 3D facial authentication system. Focus is on acquisition & processing of 3D facial data, different 3D facial representations i.e. models & various 3D facial features. Advantages & disadvantages of different representations & features are discussed. paper reviews state of art 3D facial authentication systems & their identification & verification results achieved on an established & widely used 3D facial database.

Mariusz Leszczyński (2010) have worked on image preprocessing for illumination invariant face verification. "Performance of face verification system depends on many conditions.

One of most problematic conditions is varying illumination condition. They have compared 14 normal algorithms based on histogram^[29] normalization, illumination properties & human perception theory using 3 verification methods.

3. OBJECT OF RESEARCH

Time Complexity: Objective is to reduce time take 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.

2D Biometrics	Traditional 3D Biometrics	Recent 3D Biometric
4.85893	4.85893	5.02431
	4.51895	3.49762
0.027411	0.0597542	0.0164728
6636	13262	6977

4. APPLICATION AREA

Electronic passports[1]s

An electronic passport is travel document containing a contactless integrated circuit chip within which is contained data from MRTD data page, a biometric measure of passport[12] holder & a security object to protect data within Public Key Infrastructure cryptographic methods.

The International Civil Aviation Organization (ICAO)[20] have studied biometrics & their potential to enhance individuality confirmation within passports & other travel documents since 1998, & subsequently developed technical standards for incorporation of biometric recognition within MRTDs. In 2002, face was recommended as primary biometric, mandatory for global interoperability within passport inspection systems, while fingerprint & iris were optional as secondary biometrics to be used at discretion of passport-issuing state. selection of face recognition as first choice technique raised questions & met within some criticism, due to some poor face recognition correctness at that time. In addition, a number of security were verification that allowed impostors to access, eavesdrop or modify biometric & other personal data of passport holder contained on RFID chip. Most of these flaws were fixed within subsequent versions of electronic passports, for event by strengthening basic access control (BAC) through extended access control mechanisms, by implementing chip verification to prevent cloning of chip, & by establishing strongly secured exchange of information between passport & reader terminals. At present, more than 60 countries—including developing & developed ones—have issuing started within electronic passports.

Vascular recognition within ATMs

Japanese vendors have developed systems that verify individuality claims made by individuals based on unique pattern of veins within their palms & fingers.. Since 2004, this technology have been deployed within 66,463 ATMs of 289 Japanese bank groups to secure access to more than two million accounts. . To authorize a transaction, customer is required to present to ATM a banking card, corresponding PIN & vascular pattern of palm or finger, which corresponds to a three-factor confirmation scheme of possession, knowledge & biometric. third factor



could be used to authorize withdrawals of big amounts. Vascular style are regarded as secure & tamper-proof biometric traits, as they are inside human body. This large-scale deployment of biometrics within a commercial application proved to be successful & other banks started to equip their ATMs within biometric recognition capabilities.

Age recognition[21] cigarette vending machines

A different biometric recognition is embedded within cigarette vending machines to ensure that buyers are not underage. Facial features of smoker, such as wrinkles surrounding eyes, facial bone structure & skin sags, are studied by vendor & compared to facial data of more than 100,000 people enrolled within a database to estimate age. Functioning is similar to identification mode of biometric systems described above. System might operate within favor of minors looking older than they are & to disadvantage of "baby-faced" adults that might have to verify their age differently. In a test within 500 people ranging within age from their teens to their 60s, this software has able to identify adults within 90 per cent accuracy.

5. FUTURE SCOPE

In future Palm Print process[1] is found to be most secure as compared to other biometric techniques. It could be useful to enhance secure transaction within banks & other financial organization. However there are many challenges within frequent use of this technology but within future due to advent of new technology it would be possible to use this technology easily.

Enterprise & government both acknowledge convergence of physical & information security environments, but there are new security challenges on horizon - just-in-time inventory control, sophisticated supply chain management[12], & even a phenomenon called "coopetition"-in that companies that compete within some areas, cooperate within others. Managing this convergence of physical & information security requirements now drives security system architecture design & implementation & is an increasingly key factor within biometric technology selection. Managing convergence would only become a more complex task because as IT & communications becomes increasingly wireless, there is a need for robust individuality management would

become more acute. Palm Print 3D sees this technology as a natural "fit" for within physical, & wireless arenas. This growing need, as well as Palm Print 3D competence within this technology, coupled within core interests within IT & wireless, provides impetus for design efforts for future - & makes Palm Print 3D one to watch for new developments within individuality management tomorrow & beyond.

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