

# Multimodal Biometric System in Secure e-Transaction in Smart Phone

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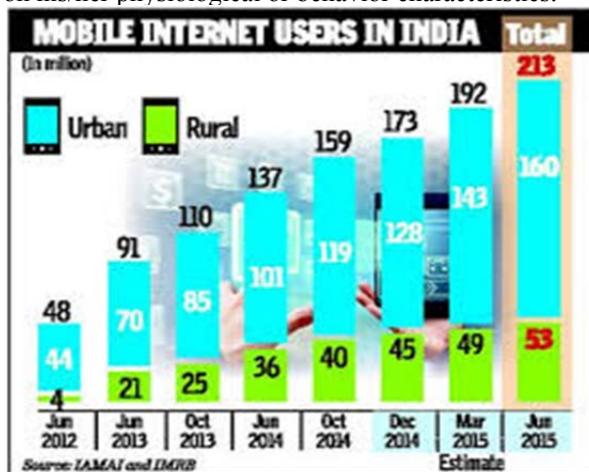
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**Abstract:-**Now a day, e-commerce sites are very popular. Online shopping using wap enabled mobile phone has widely come into use. Debit and credit cards are used for secure e-transaction. As the technology developed thief are also very smart, they stolen our detail from wap and use it. we present a model that can be used for secure transaction during using smart phone and give the features of smart phone where we do the save transaction. In this paper we present a multi biometric model (used face, voice) that identified the authentic person.

**Keywords:** - multibiometric, identification, E-commerce, e-transaction.

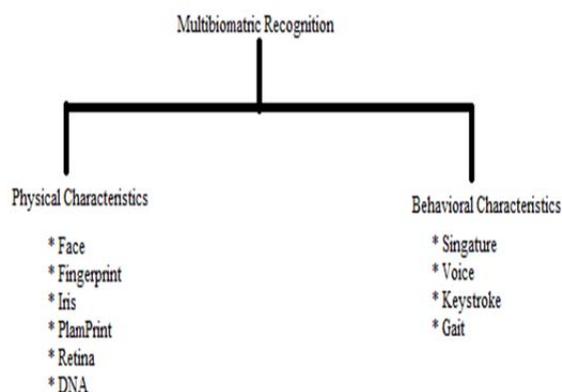
## 1. INTRODUCTION

In the age of information technology biometric identification is the heart of computer implementation. The age of information technology, all user want fast, secure, reliable data transfer. There for we use password, pin number during transaction on phone or computers. That is not much secure. Because there are more than 4-5 million cell phones are present over the world. All users' uses chat, sms, video calling, e-business etc. in this paper we proposed a model where the data transaction much secure. Integrating both face and voice biometric identification makes secure data transaction. Biometric is a physical or biological attribute that can be measured. Biometric identification accepts or rejects the person's identity, based on his/her physiological or behavior characteristics.



A biometric identification system is essentially a pattern – recognition system that recognized a person based on a

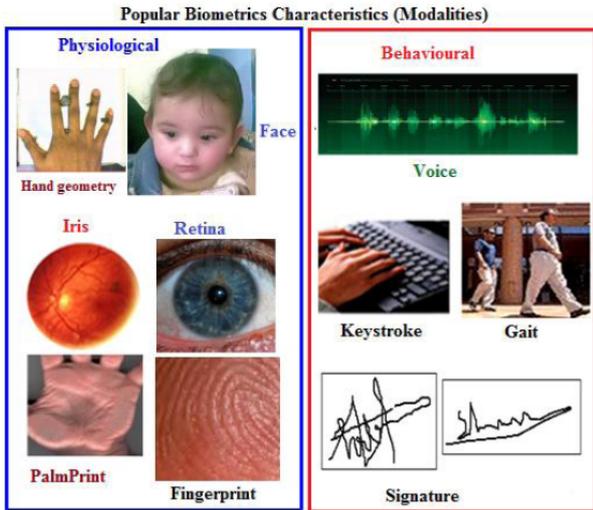
feature derived from specific physiological or behavior characteristics.th person possessed for authentication or identification purposes .Most biometric systems deployed in real word application are unimodel. These systems suffer with problem such as noised in sensed data, non-universality, upper bound on identification accuracy and spoof attacks. In this paper examined the possible performance improvement of biometric system by using multiple biometrics, integrating with other multiple biometric sources.



## Characteristics of biometric:-

- 1-UNIVERSALITY
- 2-UNIQUENESS
- 3- PERMANENCE
- 4- COLLECTABILITY
- 5-ACCEPTABILITY
- 6- PERFORMANCE

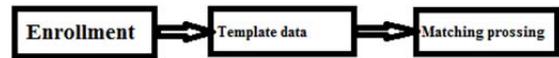




which biometric images are encoded, compared and recognized by a computer. It is desirable to develop a feature analysis method which is ideally both discriminating and robust for face and hand voice biometrics. On one hand, the biometric features should have enough discriminating power to distinguish interclass. a complete biometric system majorly is characterized by three elements namely;

- Enrollment
- Template representation
- Matching process

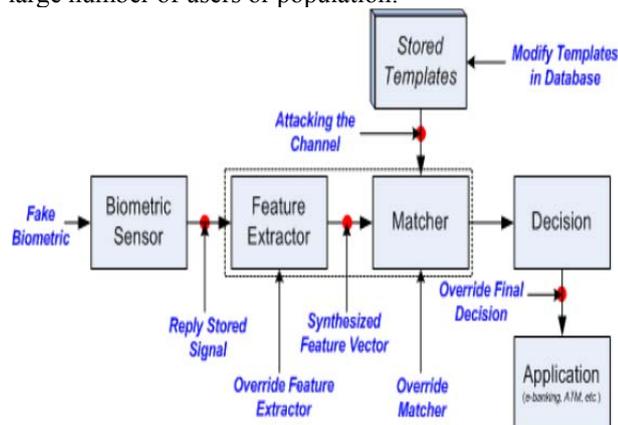
These three main elements are depicted in the figure below:



**2. RESEARCH BACKGROUND**

In our work, two popular public biometrics are used “face and voice”. In first stage image acquisition of face is performed by using camera using different techniques for each biometric. Similarly Voice is also capture by micro phone and store with different templates. In the second stage three feature extraction techniques are applied. We follow the combination approach to score level fusion and address some of the issues involved in computing a single matching score given the scores of different modalities.

In the third stage: matching scores from each matcher are arrived. In the fourth stage: each subsystem produce its individual decision, in our work every subsystem has two decision values either low or high. Then fusion of these decisions is executed to get unary decision in the end. The objective of this research is to Designing and implementing a multimodal biometric system of the combined biometrics "Voice and face" and then fusing them at the decision level. The reason to use two biometric traits face and voice is the desire to get high degree of discrimination when we have large number of users or population.



**3. TAXONOMY OF MULTIBIOMETRIC SYSTEM**

Face, fingers print and hand geometry and voice texture patterns are accurate biometric modalities with successful applications for personal identification. The success of a texture biometric recognition system heavily depends on its feature analysis model, against

**4. MULTIBIOMETRIC RECOGNITION**

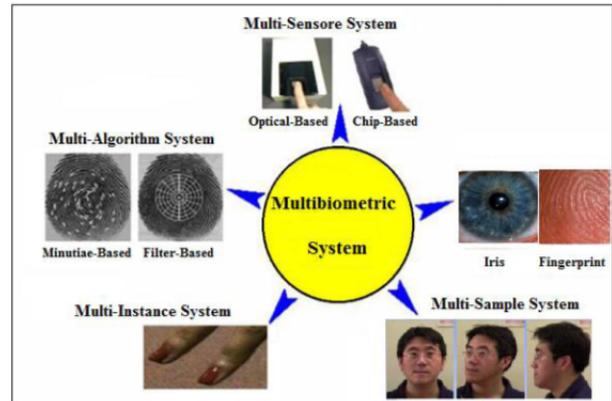


Figure:- Different Types of Multibiometric

**Face:**

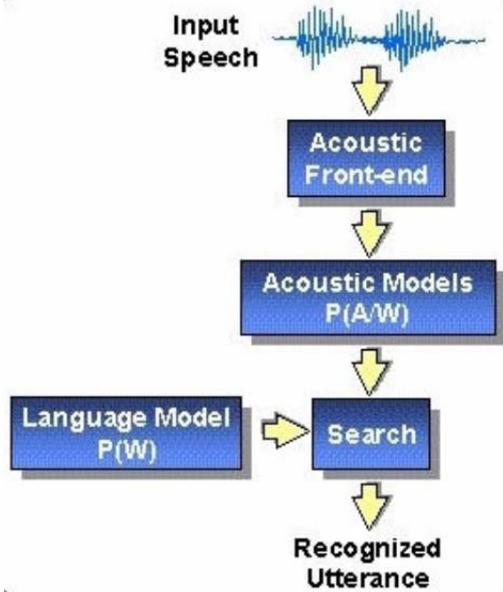
Face recognition is a biometric which uses computer software to determine the identity of the individual. Face recognition falls into the category of biometrics which is “the automatic recognition of a person using distinguishing traits”. Facial attributes are probably the most common biometric features used by humans to recognize one another. The most popular approaches to face recognition are based on either (i) The location and shape of facial attributes, such as the eyes, eyebrows, nose, lips, and chin and their spatial relationships, or (ii) the overall (global) analysis of the face image that represents a face as a weighted combination of a number of canonical faces.



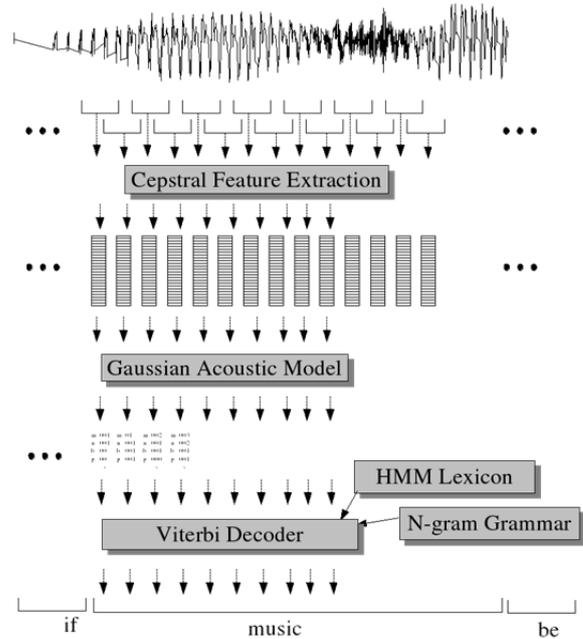
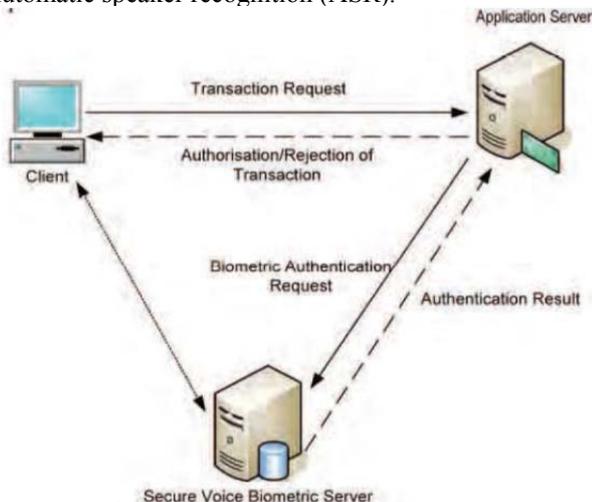
**VOICE RECOGNITION**

Two persons different voice thus we must have recognition the unique person through its own voice. The voice-specific characteristics of speech are due to difference in physiological and behavioral aspects of the voice production system in humans. The main physiological

characteristic of the human voice production system is the vocal tract shape. The vocal tract modifies the spectral content of an acoustic wave as it passes through it, thereby producing speech. So that, it is common in voice verification systems to make use of features derived only from the vocal tract. The microphone in the mobile phone captures the voice. Then, using spectral analysis, an utterance may be represented as a sequence of feature vectors. Utterances, spoken by the same person but at difference times, result in similar yet a different sequence of features vectors. So, the irrespective of the mood of the consumer, his transaction is accepted or rejected. A voice signal conveys a person's physiological characteristics such as the vocal chords, glottis, and vocal tract dimensions.



Automatic speaker recognition (ASR) is a biometric system that encompasses verification and identification through voice signal processing. The voice features encompass high-level and low level parts. While the high-level features are related to dialect, speaker style and emotion state that are not always adopted due to difficulty of extraction, the low-level features are related to spectrum, which are easy to be extracted and are always applied to Automatic speaker recognition (ASR).

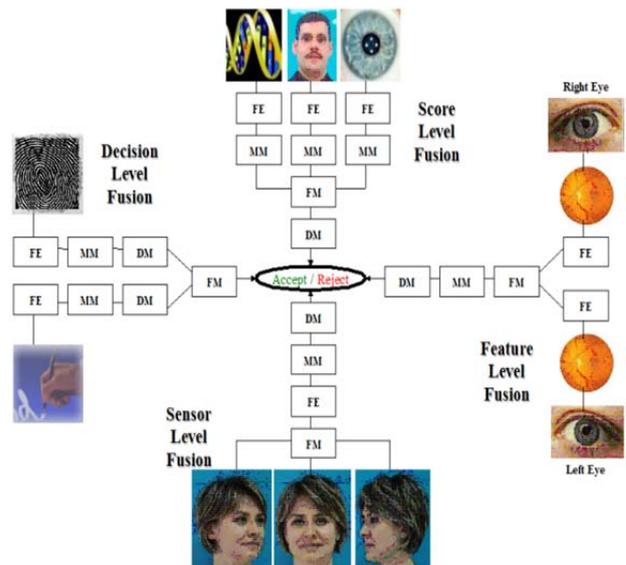


**5. FUSION IN MULTI BIOMETRIC SYSTEMS:**

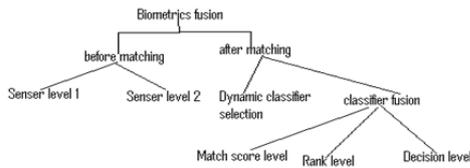
We have more than one decision channels. We need to design a mechanism that can combine together the categorized result from each biometric channel; this is called as biometric fusion. Multimodal biometric fusion combines measurements from different biometric traits to enhance the strengths and diminish the weaknesses of the individual measurements. Fusion at matching score, rank and decision levels have been extensively studied in the literature.

Multimodal Biometrics with various levels of fusion: sensor level, feature level, matching score level and decision level.

- A. Sensor level Fusion:
- B. Feature Level Fusion:
- C. Matching Score Level:
- D. Decision level Fusion:



**Levels of Information Fusion:**



The application multimodal biometric indicates the presence and use of more than one biometric aspect in some form of combined use for making a specific biometric verification/identification decision.

The goal of multi-biometrics is to reduce one or more of the following:

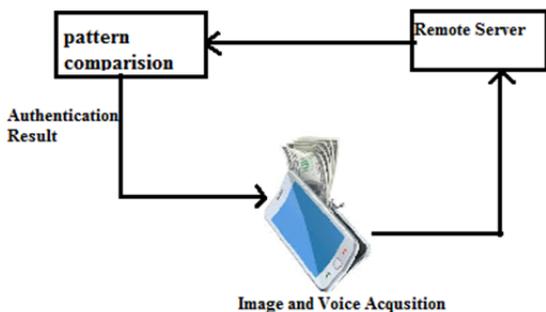
- **False accept rate (FAR)**
- **False reject rate (FRR)**
- **Failure to enroll rate (FTE)**
- **Susceptibility to artifacts or mimics**

Multimodal biometric systems acquire input from single or multiple sensors measuring two or more than two different modalities of biometric Characteristics. For example, a system combining face and voice characteristics for biometric recognition would be considered a “Multimodal” system regardless of whether face and voice were captured by different or same imaging devices or micro phones. It is not required that the various measures be mathematically combined in anyway. For example, a system with voice and face recognition would be considered “multimodal” even if the “OR” rule was being applied, allowing users to be verified using either of the modalities.

**Need for Biometrics in Mobile Phone:-**

Shopping through internet, online money transfer becomes more popular. But other hand user wants to secure transaction. Here we give two methods for checking the templates.

In first case phone are collecting the biometric templates and matching with remote sever through internet. In the second case all the biometric template resides on cell phone.



**Architural framework of Multibiometric process flow:-**

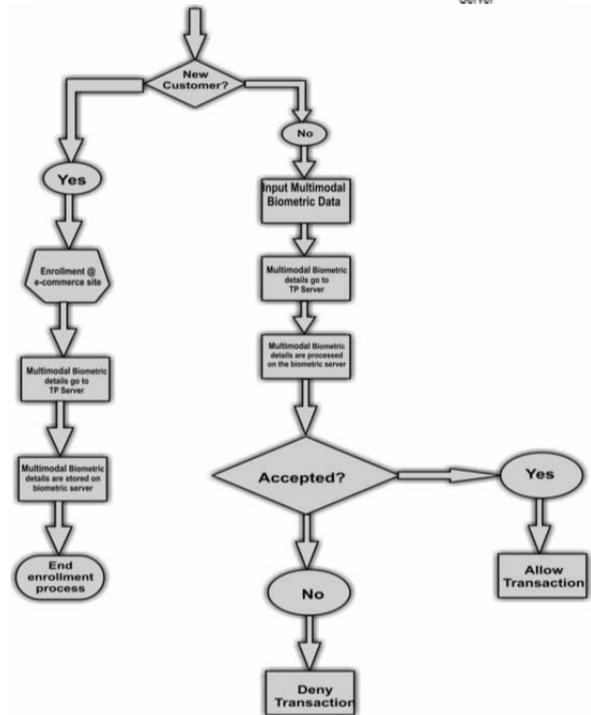
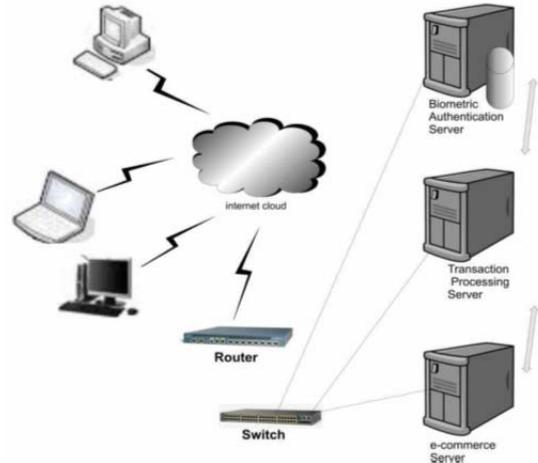


Fig 2: Process Flow of the Multimodal Biometric Architectural System Framework

**6.CONCLUSION**

This paper examines the performance of multimodal biometric system using face and voice matchers on some individuals. The performance of sum rule, product rule, Fusion of face and Voice systems at decision level was proposed. This platform is necessary if we have treat huge databases that contain hundreds millions of user in remote server. Each subsystem gives its individual decision, and then these decisions will be used directly which gives excellent accuracy. Therefore the user of smart phone will be more secure due to multibiometric identification. Our experimental results showed that multimodal multiple biometric data can achieve significantly better performance compared to a single biometric system. In the future we will use other methods to fuse the decisions and comparing them with fuzzy logic to determine who will present less computation time and highest accuracy. Minimum rule, and maximum rule fusion on multimodal system (face and voice) has been evaluated.

### REFERENCES

- [1] Shuo Wang and Jing Liu , Department of Biomedical Engineering, School of Medicine, Tsinghua University, P. R.China “ Biometrics on Mobile Phone ” www.intechopen.com
- [2] Informatica Economică vol. 13, no. 1/2009 “ Biometric Security for Cell Phones ”
- [3] Nimalan Solayappan and Shahram Latifi, Department of Electrical engineering, University of Nevada at Las Vegas, USA, “ A Survey of Unimodal Biometric Methods”
- [4] International Conference on Telecommunication Technology and Applications, Kounoudes et al., 2006, Voice Biometric Authentication for Enhancing Internet Service Security, pp. 1020-1025, with permission from IEEE.
- [5] G. Williams, “More than a pretty face”, Biometrics and martCard Tokens. SANS Institute reading room, 2002, pp. 1-16.
- [6] A. K. Jain, K. Nandakumar, U. Uludag, and X. Lu, “Multimodal Biometrics”, from Augmenting Face With Other Cues, in W. Zhao, and R. Chellappa, (eds) Face Processing: Advanced Modelling and Methods, Elsevier, New York, 2006. pp. 675-705. Recognition”, in Proceeding
- [7] J.P. Campbell, D.A. Reynolds, and R.B. Dunn, “Fusing High And Low Level Features for peaker
- [8] J. Ortega-Garcia, J. Bigun, D. Reynolds, and J. Gonzalez-Rodriguez, “Authentication Gets Personal With Biometrics”, in IEEE Signal Processing Magazine, Vol. 21, 2004, pp. 50–62.
- [9] A.K. Jain, A. Ross, and S. Prabhakar, “An Introduction To Biometric Recognition”, in IEEE Transactions on Circuits and Systems for Video Technology, Vol. 14, No.1, 2004, pp. 4–20.
- [10] Mohamed abdolahi,majid mohamadi, mehdi jafary 2013. Multimodal Biometric system Fusion Using Fingerprint and Iris with Fuzzy Logic. IJSCE ISSN: 2231-2307, Volume-2, Issue-6, January 2013.
- [11] Fan Yang and Baofeng Ma. 2007. A new mixed-mode biometrics information fusion based-on fingerprint, hand-geometry and palm-print. In Image and Graphics, 2007. ICIG 2007. Fourth International Conference on, pages 689–693. IEEE.
- [12] Mohamad Abdolahi, Majid Mohamadi, and Mehdi Jafari. 2013. Multimodal biometric system fusion using fingerprint and iris with fuzzy logic. International Journal of Soft Computing and Engineering,2(6):504–510.