

## MULTIMODAL BIOMETRIC RECOGNITION BASED ON FUSION OF LOW RESOLUTION FACE AND FINGER VEINS

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**ABSTRACT.** *Multimodal biometric systems utilize multiple biometric sources in order to increase robustness as compared to single biometric system. Most of the biometric systems in real are single or multimodal authentication system. This paper presents an efficient multimodal low resolution face and finger veins biometric recognition system based on class specific liner discriminant to client specific discriminant analysis and finger veins fusion at score level. Simulation results show that the proposed multimodal recognition system is very efficient to reduce the FAR and increase GAR, but it is more computationally complex due to processing involved in layered computation of LDA and CSLDA at runtime.*

**Keywords:** Multimodal biometric system, Face, Finger veins, CSLDA, Fuzzy fusion

1. **Introduction.** Biometric is the field of pattern recognition to recognize the identity based on physical, i.e., face, finger veins, palm or behavioral, i.e., voice, signature, walking style, patterns of human. During the last decades, biometrics has been an intensive field of research and consequently the number of recognition approaches has been proposed by using either single biometric or multiple biometrics. Commonly used biometrics are face, finger veins, finger print, palm, voice, signature, iris, etc. Uni-biometric system has several limitations such as noise during sensing, non-universality, inter-class similarities, intra-class variations, spoof attack and distinctiveness, etc. [1], and thus, uni-biometric system may lead to false acceptance rate (FAR) and false rejection rate (FRR) [2]. Multimodal biometric is the combination of multi-biometrics to increase the performance and robustness against imposter attack and environment variations to overcome the limitation involved in uni-modal biometric system. However, combining the multi-biometrics is not 100% guarantee to provide the better solution.

With respect to processing methodologies biometric is classified into two classes: authentication/verification and recognition. Identification is the process to find a person by comparing the pattern with claimed identify. Where as in recognition pattern is compared with the pattern of every pattern in the database yielding either score or distance to identify probe identify. This paper presents novel recognition by performing fusion on