**ABSTRACT**

Biometrics refers to authentication techniques that rely on humans physical and behavioral characteristics that can be automatically checked. Biometric based authentication system provides robust security and ease of use than conventional methods of verification system. Multimodal biometric system is one of the major areas of study identified with large applications in recognition system. Unimodal biometric systems challenge with a wide variety of problems such as noisy data, Intra-class variations, non-universality, and spoof attacks. Some of these limitations can be solved in multimodal biometric system. In proposed work, face and fingerprint biometric traits are used for multimodal biometric authentication system. Biometric traits are transformed using distortion algorithm. After the transformation processes pre-processing of images are done to improve the clear visibility of images. The extractions of minutiae feature from fingerprint are achieved using Crossing Number concept and the face features are extracted using the Local Binary Pattern algorithm. To combine both the face and fingerprint features feature level fusion is used. In order to provide additional security to the proposed work the fuzzy vault is introduced by adding duplicate values and having a secret key to lock and unlock the system. Fuzzy vault and distortion acts as an additional layer of security in multimodal biometric user authentication system.