**ABSTRACT**

The major concern of almost all the verification system is user authentication and security. This necessitates the development of a mechanism that ensures user security and privacy. A lot of research has been carried on this developing field and numerous techniques have been proposed earlier in literature. These traditional methods use tokens and passwords to provide security to the users. Uncertainly, it can be easily compromised by attackers and therefore it is significant to design verification system that ensures authentication. In recent years, technology has turned in favor of combining soft biometrics and cryptographic key generation technique. The principal feature of using soft biometric template is that it cannot be easily revoked by any unauthorized user. Most commonly used soft biometric features are iris, retina, face, fingerprint, voice and so on. Fuzzy vault is the framework which comprises of the combination of soft biometrics and cryptographic key generation technique. This fuzzy vault acts as an additional layer of security. This overcomes the limitation met by a biometrics system when implemented individually. This paper proposes a biometric verification system investigating the combined usage of soft biometrics features hardened by fuzzy vault scheme. This approach uses retina as a soft biometric since it is capable of providing best results. Experiments were conducted to investigate the performance of the proposed authentication system in ensuring the user security and privacy.