**ABSTRACT**

The important aspect of all verification system is authentication and security. This aspect necessitates the development of a method that ensures user security and privacy. The traditional methods such as tokens and passwords provide security to the users. Uncertainly, the attackers can easily compromise these techniques. In recent years, the combination of biometrics and cryptography techniques has been proved as a efficient way to achieve security. The important feature of using biometric template is that it cannot be exploit by an unauthorized user. Most commonly used biometric features are iris, retina, fingerprint, face, palmprint, hand geometry, voice and so on. Fuzzy vault is the concept which uses the combination of biometrics and cryptographic key generation technique. This fuzzy vault act as a additional layer of security. This paper proposes a biometric verification system investigating the combined usage of multimodal biometric features and fuzzy vault scheme. This approach uses of fingerprint and iris in order to provide higher accuracy rate. Experiments were conducted to investigate the performance of the proposed system in ensuring the user security and privacy.