

## **ABSTRACT**

### **CERTAIN INVESTIGATIONS ON ORTHOGONAL MOMENTS BASED UNIMODAL AND MULTIMODAL HAND BIOMETRIC SYSTEMS**

Biometric technology has developed and reached the level of maturity that it is now, as a response to the growing worldwide demand for automated human identification. It is a technology where the biological traits of individuals such as retinal iris scanning, voice patterns, dynamic signatures, fingerprints, face or hand measurements, are used to automatically identify the individual. Fingerprint and Palmprint are the pattern of the skin present on the finger and palm respectively. In this research, orthogonal moments are suggested for extracting invariant, highly discriminative features from fingerprint, palmprint and face biometrics. The performance of Legendre moments is the highest for palmprint and face and the performance of the Pseudo-Zernike moments is the highest for fingerprint. Multimodal fusion of biometric feature sets is performed to increase the accuracy of biometric recognition. Following the computation of classification accuracy of the unimodal fingerprint and palmprint systems, multimodal fusion of the same is performed. Among the unimodal and multimodal systems involving palmprint, fingerprint and face biometrics, the Unimodal palmprint system using Legendre moments for feature extraction and Bayesian Belief net for classification gives the highest performance. This outperforms the unimodal and multimodal system using several other methods for feature extraction and classifiers for recognition.