

# **Personalized offline signature verification using multiple HMM-classifiers and SOM-fuzzy decision fusion**

## **Abstract**

This paper presents a user-optimized multiple classifiers approach for an offline signature verification system. Local features are extracted from a sliding window that slides across the signature images. Multiple HMM-based classifiers are used for the soft decisions, where each classifier is trained on a particular feature. In this work, we select the two best features to represent each user via ANOVA statistical analysis. A fuzzy decision fusion system that is tuned using SOM based clustering technique is used to combine the soft decisions from the selected HMM classifiers in producing the final verification output. The system has been tested on SIGMA signature database which is a collection of over 6000 genuine and 2000 forged signatures. Results show that our personalized multiple classifiers approach outperforms common single classifier systems.

**Keyword:** Fuzzy decision fusion; Hidden Markov model; Multiple classifiers; Offline signature verification system; Self organizing maps