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**Abstract**

Fusion of matching scores of multiple biometric traits is becoming more and more popular and is a very promising approach to enhance the system's accuracy. This paper presents a comparative study of several advanced artificial intelligence techniques (e.g. Particle Swarm Optimization, Genetic Algorithm, Adaptive Neuro Fuzzy Systems, etc...) as to fuse matching

scores in a multimodal biometric system. The fusion was performed under three data conditions: clean, varied and degraded. Some normalization techniques are also performed prior fusion so to enhance verification performance. Moreover; it is shown that regardless the type of biometric modality , when fusing scores genetic algorithms and Particle Swarm Optimization techniques outperform other well-known techniques in a multimodal biometric system verification/identification.

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### Index Terms

Computer Science

Artificial Intelligence

**Key words**

Adaptive Neuro Fuzzy Systems (ANFIS)

Genetic Algorithm (GA)

Support

Vector Machine (SVM)

Unconstrained Cohort Normalization (UCN)