Information fusion at the matching score level is widely used, due to the simplicity in combining the scores generated by different matchers. Since the matching scores output by various
modalities are diverse in numerical range, score normalization is needed first, to transform these scores into a common domain. Then score fusion is to be carried out on the normalized scores. In this paper, we have studied the performance of different normalization techniques and fusion rules in the context of a multimodal biometric system based on iris and palm print traits of a user. The conventional normalization techniques used for testing are min-max, median-MAD, double-sigmoid and tanh. These normalized results are combined using tanh, mean, sum, product, min, max and median fusion methods. Also, we propose two novel normalization methods namely modified tanh normalization and max normalization as well as a new modified min-max fusion technique for biometric verification. The experimental results on CASIA iris and palm print databases show that the application of proposed max and modified tanh normalization schemes followed by mean and tanh fusion methods result in better recognition performance compared to all other methods.

Reference


**Index Terms**

Computer Science  
Security

**Key words**

Iris  
Multimodal biometrics  
Normalization

Palm print

ROC

Score level fusion