

leading to a robust estimation of the local area size. A low-order SMQT dynamic range adjustment is conducted locally in order to achieve reliable features extraction used in the matched filter design and in the image segmentation. The matched filter block is improved by applying order statistical filtering to the extracted features, thus reducing spurious outliers in the feature data. Image segmentation is done by K-means algorithm. The proposed method combines and updates existing processing blocks into a new and robust fingerprint enhancement system. The updated processing blocks lead to a drastically increased method performance where the EER is improved by a factor two, and the AAC is improved by a factor 12, in relation to the original method. The proposed method improves the performance in relation to the NIST method, and this is particularly pronounced on fingerprint images having a low image quality. The evaluation results indicate that the method is able to adapt to varying fingerprint image qualities, and it is stressed that the proposed method has not been tuned in favor towards any database.

A possible future research direction is to perform a detailed and systematic analysis of the impact of the different chosen design parameters. Furthermore, various optimizations of the implemented processing steps could reduce the number of instructions required by the proposed method.

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