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Quality-Based Fingerprint Segmentation

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ABSTRACT. The need for segmentation of low quality fingerprints in forensics, high security and civilian applications is constantly increasing. Most segmentation algorithms proposed in the literature normally deal with separation of the background from the foreground. However, low quality foreground regions must also be removed to lower errors in feature extraction, matching and decision modules. In this research work, a quality based fingerprint segmentation algorithm is proposed. The proposed algorithm is block-wise, it utilizes the auto-correlation matrix of gradients and its eigenvalue to compute the score quality measure of each block. The score quality measures both local contrast and orientation in each block. The threshold is computed by taking the mean for all the scores assigned to each block. It was evaluated on FVC 2002 and NIST High Resolution 27A databases. Its performance compared to other algorithms was evaluated by independent fingerprint quality measure algorithm. The results from both FVC and NIST databases show that the proposed algorithm results are promising.