System of invariant features for fingerprint recognition

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Abstract

Personal identification using fingerprint recognition generates sustainable interest and is important for security purposes. Currently, most fingerprint recognition systems include computer-intensive operations. The works [3, 4] investigate the method of fingerprint recognition based on the directional field. However, this method is only suitable for small databases (no exceeding 10^4 elements). The main problem preventing the use of this method with larger databases is the dependence of the directional field on the fingerprint orientation. In order to use the directional field method for recognizing fingerprints in larger databases (up to 10^6 elements), it is necessary to use the features that are invariant to the fingerprint orientation. This work proposes to use Zernike expansion coefficients of Fourier spectrum of a complex directional field for this purpose.

Keywords: fingerprint, security, database, Zernike expansion coefficient, Fourier spectrum, invariant feature.

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