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Influence of degrading factors on the optimal spatial and spectral features of biometric templates

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Abstract

Various distortions in the source data not only decrease the overall identification performance of a biometric system, but also alter the optimal parameters of a template creation method. In this work the influence of distortions to wavelength and spread parameters of the wavelets is presented. Three types of source data degrading factors are investigated: image blurring, image noise and iris segmentation errors. Two most popular methods of template creation, Gabor and Log-Gabor transforms are involved. CASIA and NDIRIS public domain databases are used for tests. It is shown that the optimum wavelength is strongly altered by image degradation whereas the optimal ratio of wavelength to spread, which defines filter shape, stays almost constant.

Keywords: Iris Recognition, Gabor transform, Biometric Template

1. Introduction

The work-flow of human identification by the iris image contains several steps: obtaining eye image, segmentation of the iris region, building the iris feature set (referred to as the template), and finally matching two such sets by a distance function. These steps were described in the very early works on iris identification [1, 2]. Therein methods of detecting stable and informative iris

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