

论文

傅里叶-梅林变换 (FMT) 在畸变-不变图像识别中的应用

吕占伟; 邓传加

中国人民解放军91550部队装备部,辽宁大连116023

摘要:

针对尺度缩放和角度旋转变目标相关识别率低的问题,在联合相关识别中加入傅里叶-梅林变换方法。采用傅里叶-梅林变换(FMT)中的对数极坐标变换、梅林变换、傅里叶变换具有的旋转、尺度、平移(RST)不变性,可以提高JTC图像识别的性能,实现畸变-不变图像的识别。利用联合变换相关器对角度旋转0°~40°、尺度变化0~20%的目标进行计算机仿真实验。实验结果表明:在JTC中采用FMT可以实现畸变-不变图像的识别。

关键词: 傅里叶变换; 梅林变换; 对数极坐标变换; 傅里叶-梅林变换; 联合变换相关

Application of Fourier-Mellin transformation (FMT) in distortion-invariant image recognition

Lü Zhan-wei; DENG Chuan-jia

Unit 91550 of PLA, Dalian 116023, China

Abstract:

Fourier-Mellin transformation (FMT) was added in the optical joint transform correlator (JTC) recognition of the rotating and rescaling targets to overcome the low recognition ratio. The log-polar transformation, Mellin transformation and Fourier transformation used respectively in the Fourier-Mellin Transformation (FMT), which has the invariance of rotation, scale and translation (RST), can eliminate the effect of distortion and improve the performance of image recognition. The simulation experiment of the correlation recognition for the targets with rotation angle of 0-40° and the dimension variation range of 0-20% was carried out with JTC. In comparison with the results of FMT, it is found that FMT added to JTC can realize the distortion-invariant image recognition.

Keywords: Fourier transformation (FT) Mellin transformation (MT) log-polar transformation (LPT) Fourier-Mellin transformation (FMT) joint transform correlation (JTC)

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通讯作者: 吕占伟(1974-),男,山东海阳人,中国人民解放军91550部队装备部工程师,主要从事装备试验方面的研究工作。

作者简介:

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