学术探讨

基于对数极坐标频谱的Gabor纹理分析

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摘要　　提出一种基于对数极坐标频谱的Gabor纹理分析方法（LPFG），该方法以对数极坐标的形式表示图像在频率空间的频谱分布, 利用多通道Gabor滤波器进行频率分析, 从而提取图像的纹理特征, 并结合改进的最小距离判别方法实现了有效的纹理分割;此外, 从理论上分析了该方法与Log Gabor小波分析的一致性, 由此推导了Log Gabor小波的参数计算方法;并从实验的角度与传统方法进行了比较, 证明该方法在性能和效率上均优于传统方法。

关键词　　对数极坐标频谱　Gabor滤波器　Log Gabor小波　纹理分割

分类号

Texture analysis based on log polar frequency spectrum and Gabor

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Abstract

  A method for texture segmentation basis on log polar frequency spectrum and Gabor filters has been brought forward.The proposed method denoted the spectrum distribution of an image in frequency domain with log polar coordinates,and completed multi-channel frequency analysis by using Gabor filters to extract the texture features.Then the proposed method efficiently implemented texture segmentation combining Minimum Distance Classifier.Furthermore,an analysis has been made to compare the congruency between the new method and Log Gabor wavelet.And the way of computing the parameters of Log Gabor wavelet is also educed.Comparisons have been made with traditional methods by experiments which has proved that the new method has advantages of better performance and more efficiency than traditional methods.

Key words　log polar frequency spectrum　Gabor filters　Log Gabor wavelet　texture segmentation

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