



### 一种适合于大尺寸航拍图像的特征点提取方法

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### A Feature Point Extraction Method for Large Size Aerial Images

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摘要

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#### 摘要

一些航拍图像的尺寸较大, 现有的特征点提取算法在对其处理时均要耗费大量的时间, 针对这一问题, 提出一种快速有效的特征点提取算法。首先构造原始图像的拉普拉斯金字塔, 以获得图像的尺度信息, 同时保留图像的方向信息; 再使用非均匀多方向滤波器组将金字塔图像分解在不同方向上, 在分解后的图像中提取局部极值点作为候选特征点集; 采用特定的合并策略合并候选特征点最终得到特征点集, 并根据方向滤波器组为特征点分配方向向量。试验结果表明, 本文算法在基本保证提取到的特征点匹配率及正确率的前提下, 有较高的效率。

关键词: 航拍图像 特征点提取 特征点匹配 拉普拉斯金字塔 方向滤波器组

#### Abstract:

The existing feature point extraction methods usually cost a lot of CPU time when they are applied to large size aerial images. For the purpose of fast extraction of feature points in these large size aerial images, a novel method is developed. Usually these aerial images have not only large sizes but also wide ranges of shooting. They usually have different feature point performances on different scales and the distributions of spectra are uniform in the frequency domain. In this paper, the scales of the feature points are kept by employing the Laplacian pyramid, and a specified non-uniform N-dimensional directional filter bank is applied to decompose the pyramid images. The scales and the directions of the images are extracted. Then the local extreme points are extracted as a candidate feature points set. Finally, the candidate feature points in different directions are merged by a specified merge-strategy. Thus, we obtain the final feature points set and the directions of the feature point described by the direction filter bank. Experimental results are presented that demonstrate the proposed method is efficient for large size aerial images while meeting the match rate and precision rate requirements.

Keywords: aerial image feature point extraction feature point matching Laplacian pyramid directional filter bank

Received 2013-04-07; published 2013-07-12

#### Fund:

国家自然科学基金(61170185); 辽宁省科技攻关计划项目(2011217002)

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