

应用

多光谱遥感卫星图像的精确配准方法研究

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摘要:

针对一组多光谱遥感图像中,各谱段图像之间配准不一致的问题,本文提出了一种基于特征点的快速自动配准方法。在图像信息熵的基础上,利用环形移动窗口,自动快速寻找感兴趣区域,并利用尺度不变特征转换(SIFT)算法提取特征。为提高精度,文中对特征初匹配方法作了改进,并用余弦定理和空间距离约束条件剔除误匹配点,之后提取最稳定的特征点对计算变换参数,完成配准。最后根据配准前后图像的互信息和特征点的均方根误差(RMSE)来衡量配准的程度。通过对大量中巴地球资源卫星拍摄的多光谱图像进行实验,该方法能达到亚像素级配准精度,并能快速对各谱段图像进行配准。

关键词: 遥感图像; 环形移动窗口; 特征提取; 图像配准

Research of Accurate Registration Method for Multispectral Remote Sensing Images

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Abstract:

Aiming at the inconsistent registration between different spectral image within a group of multi-spectral remote sensing images, a fast and automatic registration method based on feature points was proposed in this paper. On the base of image entropy, an annular moving window is used to find the region of interest automatically and quickly, and the Scale Invariant Feature Transform (SIFT) algorithm is used to extract features. To increase the accuracy, we improve the primary feature matching step, and use cosine theorem and space distance constraint condition to eliminate false matching points, then extract the most stable feature points to calculate transform parameters to complete registration. At last, the mutual information of before and after the registration and the root mean square error (RMSE) of feature points are used to measure the extent of the registration. By many experiments on a large number of multi-spectral images acquired by the CBERS-02B satellite, the result indicates the method can achieve sub-pixel registration accuracy for each spectral image, and can decrease the runtime of process.

Keywords: Remote Sensing Images the Annular Moving Window Feature extraction Image registration

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