

面向InSAR稀疏控制点测图的同名点提取方法

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A Method of Homologue Points Extraction for InSAR Mapping with Sparse Control Points

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摘要

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摘要 同名点(Homologue Points, HPs)的自动提取是实现InSAR测图自动化的关键步骤之一。基于干涉相位质量约束, 该文从特征匹配的思路出发, 提出一种以质量图导引的同名点提取新方法。该方法利用SIFT (Scale Invariant Feature Transform)和SURF (Speeded-Up Robust Feature)实现不变特征检测, 并结合干涉优化准则采用三重约束的筛选法自适应地提取满足测图要求的HPs, 且不需要任何人工干预。通过对分辨率不同、尺度缩放不同、仿射变形不同、旋转变换不同以及增益差异的同航带和相邻航带相邻影像的大量实验, 验证了该文方法的有效性。

关键词: 干涉SAR 测图 稀疏控制点 同名点 质量图 单应性

Abstract: Automatically extracting the Homologue Points (HPs) is a key step to achieve the automatic mapping of InSAR. Subjecting to constraints of the interferometric phase, a quality-map-oriented approach is proposed to extract HPs from the view of detecting and matching features between adjacent SAR images. This method adopts Scale Invariant Feature Transform (SIFT) and Speed-Up Robust Feature (SURF) to detect interest points, and then the combination of three steps matching technique with criteria of interferometric optimization attributes to automatic HPs detection. Experiments on the same strip and adjacent strips demonstrate the efficiency and feasibility of the technique in the presence of magnitude speckle including significant difference in the imaging geometry.

Keywords: InSAR Mapping Sparse control points Homologue Points (HPs) Quality map Homography

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