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基于CenSurE特征的SAR/INS组合导航景象匹配算法

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Scene matching algorithm based on CenSurE for SAR/INS integrated navigation system

摘要 图/表 参考文献(0) 相关文章 (0)

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摘要

在SAR/INS 组合导航系统中, 所获取的SAR 图像可能存在严重的斑点噪声和几何变形, 对此, 提出一种基于CenSurE 特征的SAR/INS 组合导航用景象匹配算法. 该算法针对惯性组合导航的工作特点进行设计. 首先提取CenSurE 特征和垂直的SURF 描述符, 利用夹角余弦相似度量方法进行特征匹配; 然后, 采用分组一致采样算法和最小二乘精确匹配算法获取高精度的航向和位置偏差信息. 景象匹配性能评价实验表明, 在匹配适应性、匹配速度、精度和鲁棒性等方面, CenSurE 特征都很优越, 可以满足SAR/INS 景象匹配导航系统匹配修正的高性能要求.

关键词 : 惯性组合导航系统 ; CenSurE ; 图像匹配 ; 局部特征

Abstract :

In the SAR/INS integrated navigation system, SAR images have a serious distortion and serious speckle noises. Therefore, this paper presents the image matching algorithm of SAR/INS integrated navigation system based on CenSurE.
The process of the image matching algorithm is designed especially for the inertial integrated navigation. Firstly, CenSurE
features and upright SURF descriptor are extracted. And the features are matched by using cosine similarity measure. Finally, the GroupSAC algorithm and the least square algorithm are used to get the high accurate aircraft position and course
deviation. Performance evaluation experiments for scene matching show that, CenSurE detector is superior in matching adaptability, speed, accuracy and robustness, which can meet the high performance needs for matching navigation in the
SAR/INS integrated navigation system.

Key words : inertial integrated navigation system ; CenSurE ; image matching ; local feature

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