论文与报告

基于分支特征点的导航用实时图像匹配算法

冷雪飞, 刘建业, 熊智

南京航空航天大学自动化学院导航研究中心 南京 210016

摘要
为了满足景象匹配辅助导航系统需要同时获取飞行器位置和航向偏差的需要, 提出了一种基于分支特征点提取的图像匹配算法. 传统的图像匹配算法需要全局搜索匹配特征点, 耗时巨大, 而只提取分支特征点来匹配能满足导航系统实时性的要求. 在匹配算法方面, 提出了采用加权 Hausdorff 距离算法来进行匹配. 同时, 根据分支特征点的特性, 推导了相应的权值求解公式. 仿真结果表明, 本文提出的匹配算法耗时较短, 能满足导航系统实时性的要求, 且定位参数的求解也完全正确.

关键词　加权Hausdorff距离　特征点提取　景象匹配辅助导航系统

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A Real-time Image Matching Algorithm for Navigation System Based on Bifurcation Extraction

LENG Xue-Fei, LIU Jian-Ye, XIONG Zhi

Navigation Research Center, College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing 210016

Abstract
In order to ensure that the scene matching aided navigation system can acquire the aircraft position errors and yawing errors simultaneously, here we propose an image matching algorithm based on bifurcation extraction. Replacing the global search, which in image matching is a highly time consuming task, a method of extracting bifurcation for matching is presented to solve the duration problem. In this paper, an approach of the weighted Hausdorff distance algorithm is described to handle large search spaces. Moreover, based on the characteristics of the bifurcation, the corresponding weight formula in the weighted Hausdorff distance is put forward. Simulation results show that the matching algorithm takes 0.5 seconds (reference image being 160×160 pixels, query image being 80×80 pixels), and that the location parameters calculation is correct.

Key words　Weighted Hausdorff distance　feature points extraction　scene matching aided navigation system

通讯作者　冷雪飞 lengxuefei@nuaa.edu.cn
作者个人主页　冷雪飞; 刘建业; 熊智