基于带约束人工蜂群算法和平均**Hausdorff**距离的重力匹配方法

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摘　要：

重力匹配算法是实现重力辅助惯性导航系统的关键技术之一。但是，传统重力匹配方法存在复杂度高、应用范围小等缺陷，一般很难实现精确、快速匹配的效果。本文将人工蜂群算法用于重力匹配的搜索过程，并将多普勒测速仪提供的速度信息作为限制条件对蜂群搜索过程进行约束。在此基础上，利用平均Hausdorff距离对匹配结果进行筛选，在重力数据库中重力异常精度一定的条件下，可降低误配率。仿真结果表明，该匹配算法在重力特征显著的区域具有较高的匹配率，可以达到精确、快速的匹配定位，从而实现重力辅助导航。

关键词：重力匹配；平均Hausdorff距离；人工蜂群算法；外界约束

Gravity Matching Method based on Artificial Bee Colony Algorithm with Restriction and MHD

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Abstract:

Gravity matching algorithm is one of the key technologies for gravity aided inertial navigation system. However, there are lots of defects such as high complexity and small range of applications for the traditional matching methods, so it is difficult to obtain a accurate and fast matching result. This article will introduce artificial bee colony algorithm with restriction into the searching process of gravity matching and take the velocity information provided by DVL as a restriction condition to restrict the searching process of artificial bee colony. On this basis, modified Hausdorff distance (MHD) is introduced in order to select the matching results. As a result, the mismatch rate will decrease with the accuracy of the gravity anomaly in gravity database under certain conditions. The simulation results show that the algorithm is a significant feature in the gravity zone has a higher the match rate, and can obtain accurate and fast positioning in order to realize gravity aided inertial navigation.

Keywords: Gravity matching; Modified Hausdorff distance; Artificial bee colony; External restriction

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