Framed-Quadtree Path Planning for an Underwater Vehicle with the Task of Tracking a Moving Target(PDF)

《船舶与海洋工程学报》[ISSN:1002-2848/CN:61-1400/f] 期数: 2010年01 页码: 27-33 栏目: 出版日期: 2010-02-25

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关键词: regular grid; framed quadtree; data structure; algorithm efficiency

分类号: -

DOI: -

文献标识码: A

摘要: An autonomous underwater vehicle (AUV) must use an algorithm to plan its path to distant, mobile offshore objects. Because of the uneven distribution of obstacles in the real world, the efficiency of the algorithm decreases if the global environment is represented by regular grids with all of them at the highest resolution. The framed quadtree data structure is able to more efficiently represent the environment. When planning the path, the dynamic object is expressed instead as several static objects which are used by the path planner to update the path. By taking account of the characteristics of the framed quadtree, objects can be projected on the frame nodes to increase the precision of the path. Analysis and simulations showed the proposed planner could increase efficiency while improving the ability of the AUV to follow an object.

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备注/Memo: -

更新日期/Last Update: 2010-03-10