计算机工程与应用 2007 43 (28): 223-226 ISSN: 1002-8331 CN: 11-2127/TP

工程与应用

基于Fréchet距离准则的智能地图匹配算法

曹 凯[1], 唐进君[1], 刘汝成[2]

1.山东理工大学 交通与车辆工程学院,山东 淄博 255049
2.山东省胶州市公安局 机动车检测站,山东 胶州 266300

收稿日期 修回日期 网络版发布日期 2007-9-20 接受日期

摘要 为克服地图匹配过程中当前定位点信息不足的缺点,充分利用导航定位的历史轨迹信息,在分析了一些常见匹配算法后,引入了Fréchet距离来定义两曲线间的距离,并且通过设计了一种智能云模型控制器对地图匹配这种具有高度不确定性的算法进行了云规则推理,最后推导出可信度P作为地图匹配效果的评价指标,这种算法不仅能够在出现匹配错误时为使用者提供警告信息,而且还提供了一种能迅速从错误中调整恢复的方法。试验表明,当利用当前定位点信息并与历史轨迹信息结合进行匹配时,匹配的总体精度要优于只利用当前定位点信息的情况。

关键词 导航定位 Fréchet距离准则 地图匹配 云模型

分类号

Intelligent map-matching algorithm using Fréchet distance measure based

CAO Kai[1],TANG Jin-jun[1],LIU Ru-cheng[2]

1.College of Traffic & Vehicle Engineering,Shandong University of Technology,Zibo,Shandong 255049,China
2.Automobile Detecting Station of Jiaozhou City,Shandong Province,Jiaozhou,Shandong 266300,China

Abstract

To overcome the lack in data of current location and utilizes effectively historical information,a Fréchet distance measure is introduced for defining a distance between two curves on the basis of analyzing some previous map-matching algorithm and distance measures.And a cloud controller was designed to perform the uncertain cloud reasoning for map-matching algorithm,which have a higher degree of uncertainty related with the map-matched locations.Then,the credibility P is derived as an estimate index of map-matching.This algorithm could provide a warning to user and a means of fast recovery from failure.The results of the experiments demonstrated that the total matching preciseness of the proposed algorithm is better than that of the current position matching.

Key words vehicle navigation Fréchet distance measure map-matching cloud model

DOI:

通讯作者 曹 凯 E-mail：caokaifuli@126.com