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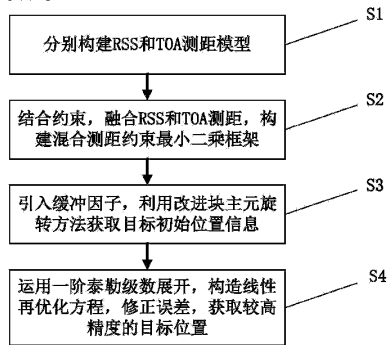
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(54) Title: INFORMATION FUSION-BASED WIRELESS SENSOR NETWORK POSITIONING METHOD FOR MARINE SEARCH AND RESCUE

(54) 发明名称: 一种信息融合的海上搜救无线传感网定位方法

[图 2]



- S1 Respectively construct an RSS-based ranging model and a TOA-based ranging model
- S2 In combination with constraints, fuse RSS-based ranging and TOA-based ranging, and construct a hybrid ranging constrained least squares framework
- S3 Introduce a buffer factor, and acquire target initial position information by using a method for improving the rotation of block principal elements
- S4 Construct a linear re-optimization equation by using a first-order Taylor series expansion, and correct errors, so as to acquire a target position with a relatively high degree of accuracy

(57) Abstract: Provided in the present invention is an information fusion-based wireless sensor network positioning method for marine search and rescue. The method includes: S1, respectively constructing an RSS-based ranging model and a TOA-based ranging model in combination with sea wave shielding noise; S2, according to constraints, fusing multi-source ranging information in the RSS-based ranging model and the TOA-based ranging model, and constructing a hybrid ranging constrained least squares framework; S3, introducing a buffer factor, and by using a method for improving the rotation of block principal elements, acquiring an initial solution of a target position by means of cyclic alternation of feasible solution indexes; and S4, on the basis of a first-order Taylor series expansion, deriving a linear re-optimization method, and performing error correction on the initial solution, which is obtained in S3, so as to obtain a more accurate solution for the position. The method has the advantage that the problem of the positioning accuracy being reduced due to an increase in the area of a monitoring region and in noise resulting from the use of marine wireless sensor network positioning technology, which only relies on a single ranging means, is solved.

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根据细则 4.17 的声明:
— 发明人资格(细则 4.17(iv))

本国际公布:
— 包括国际检索报告(条约第 21 条(3))。

(57) 摘要: 本发明提出了一种信息融合的海上搜救无线传感网定位方法, 包含: S1、结合海浪遮蔽噪声分别构建基于 RSS 和 TOA 的测距模型; S2、根据约束, 融合 RSS 测距模型和 TOA 测距模型中的多源测距信息, 构造混合测距约束最小二乘框架; S3、引入缓冲因子, 利用一种改进块主元旋转的方法, 通过循环交替可行解索引获取目标位置初始解; S4、基于泰勒级数一阶展开式, 推导得到一种线性再优化方法, 对 S3 中得到的初始解进行误差修正, 进而得到位置更为精确的解。其优点是: 解决仅依靠单一测距手段的海上无线传感网定位技术因监测区域面积增大、噪声增加而导致的定位精度下降问题。