

## 基于残差修正法的无线传感器网络定位技术

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摘要:

测距定位是无线传感器网络节点定位中一种常见的方法。然而距离测量往往容易出现错误, 导致潜在的大量非高斯误差的测量数据, 最终会导致不精确的定位结果。通过分析非线性最小平方残差定位时, 测距误差与残差的分布关系, 一种坏测距误差的误差估计方法在本文中被提出。采用估计出的测距误差, 修正了非线性最小平方残差值, 提高了定位精度。仿真实验表明, 该算法能有效估计的坏测距误差, 并改进了定位效果。

关键词: 无线传感器网络; 定位; 残差修正; 测距误差; 非线性最小平方

## Localization Technology for Wireless Sensor Networks Based on Residual Correction Method

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**Abstract:**

Range-based localization is a common method of node localization for wireless sensor networks. However, range measurements are often easily prone to errors including a potentially large number of non-Gaussian measurement errors, which would eventually lead to inaccurate localization results. By analyzing the relationships between range errors and residuals using the localization method of nonlinear least square residuals, an error estimation method for bad range errors is presented in this paper. The estimated range errors correct the residuals of non-linear least square, so the precision of localization will be improved. Simulation results show that the algorithm can effectively estimate bad range errors and improve the localization results.

**Keywords:** wireless sensor networks; localization; residual correction; ranging error; non-linear least square

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