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基于Tikhonov正则化的WSN多边定位算法研究

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摘　要：

节点定位是无线传感器网络实现监测和跟踪的一个重要前提。本文针对多边定位中的不适定问题，提出了一种基于Tikhonov正则化方法的定位算法，研究了定位模型的建立、正则化参数 的选取方法以及最优定位参考点数的选取等问题。实验结果表明本算法与典型的极大似然估计法相比，较大幅度地提高了定位精度，当 值选取600，采用5个参考节点时，定位精度可达到1米。

关键词：无线传感器网络；定位；不适定问题；正则化

Study on WSN Multilateral Localization Algorithm Based on Tikhonov Regularization Method*

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Abstract:

Node localization plays a critical role in wireless sensor networks (WSN) to complex monitoring and tracking in wide applications. In this paper, a localization algorithm based on Tikhonov regularization method is proposed for the ill-posed problem in the multilateral localization, in which the location model, the regularization parameter and the optimal reference node number are studied. Test results show that the location precision of this proposed algorithm is better than that of the Maximum Likelihood Estimation (MLE) method, and the estimate error is less than 1 meter while regularization parameter is about 600 and the reference node number is 5.

Keywords: wireless sensor networks; localization; ill-posed problem; regularization

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