

## 一种高斯噪声下基于最大分散度的WSN半定规划定位算法

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摘要：

基于最大分散度的概念，本文提出了一种新的高斯噪声下基于半定规划的WSN定位算法——MSDSDP算法。该算法将定位问题建模成一个将最大化网络分散度作为目标函数，由节点测量距离和噪声标准差确定的不等式作为约束条件的最优化问题，并将该最优化问题松弛为半定规划模型进行求解。分析及实验结果表明，该算法能有效地克服fullSDP节点估计位置向锚节点凸包中心汇聚的问题，在计算复杂度相同的情况下明显提高定位精度。将MSDSDP算法的结果作为初始点进行梯度搜索，能进一步提高定位精度。

关键词：无线传感器网络；定位；半定规划；分散度

## A WSN Semi-Definite Programming Localization Algorithm based on Maximun Scatteredness Degree in Gaussian Noise Environment

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**Abstract:**

Based on the concept of Scatteredness Degree, a new semi-definite programming algorithm for the WSN node localization in Gaussian noise environment named as MSDSDP is proposed. In MSDSDP, the localization problem is modeled as an optimization problem which takes the maximum scatteredness degree of the network as the objective function, the inequalities determined by the measured distances of nodes and the standard variance of the noise as the constraints. Then, the optimization problem can be relaxed to a semi-definite programming model to solve. Analysis and simulation results show that MSDSDP can effectively solve the problem of fullSDP that the estimated position of the nodes tends to crowd toward the center of the anchor hull, resulting in obvious improvement to the location accuracy with the same computational complexity. Using the results of MSDSDP as the initial point of gradient search method, the location accuracy will be further improved.

**Keywords:** Wireless Sensor Networks; Localization; Semi-Definite Programming; Scatteredness Degree

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