

研究简报

一种新的加权最小二乘测距定位方法

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摘要

三站二维定位问题是最小定位问题, 一般只利用几何关系就能获得定位估计, 但由于未利用距离测量的统计信息, 定位精度较差。该文先将点到点的距离测量转化为点到线的距离估计, 再在此基础上推导出一种新的加权几何定位方法, 其中加权的确定利用了距离测量的统计信息。仿真实验表明, 在测距误差较小时新方法具有更高的定位精度。

关键词 [最小定位](#) [几何定位](#) [统计信息](#) [加权最小二乘](#)

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A new weighted least-square location method for minimum-determined problem

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Abstract

The problem of 2-dimensional location using measurement provided by 3 sensors is minimum-determined problem. The solution of geometric method is obtained by direct substitution of the measured quantities and could not use the statistical information of the range measurements. In this paper, a new weighted geometrical location method is proposed for minimum-determined problem by transforming the range measurement between two points into the range measurement between a point and a line which is a known function of the actual range measurement. The new method obtains the source location by solving a weighted least square problem and the statistical information of the range measurements is used. Simulation studies show that the new location method outperforms the geometrical location method by reducing the root mean square error for scenarios with small range measurement errors.

Key words [Minimum-determined problem](#) [Geometrical location](#) [Statistical information](#) [Weighted least-square](#)

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