

## 无线传感器网络中基于粒子滤波的人员跟踪方法\*

作者: 李红春, 赵晓光, 谭民

单位: 中国科学院自动化研究所

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摘要:

人员跟踪是室内定位系统的一项重要任务。在无线传感器网络中利用信号强度实现人员跟踪, 无需专门的测距设备, 能够降低系统的复杂度和成本, 成为研究的热点。但是, 由于人体对信号传播产生比较大的影响, 给人员跟踪带来困难。本文提出一种新的信道模型, 描述有人环境下信号强度与距离的关系。跟踪算法根据该模型建立信号强度的测量模型, 并结合人的运动特点建立状态转移模型, 最后利用粒子滤波技术实现了对人员的跟踪。该方法以序贯方式估计人员的位置, 计算过程简单, 而且对信号强度的噪声不敏感。仿真和实验表明, 该方法的跟踪效果良好。

关键词: 无线传感器网络; 人员跟踪; 接收信号强度; 粒子滤波

## Particle Filter Based Human Tracking Method in Wireless Sensor Network

**Author's Name:**

**Institution:**

**Abstract:**

Human tracking problem is crucial for indoor localization systems. Received signal strength based human tracking in wireless sensor networks requires no specific ranging devices and has attracted much research interest. But effects of human body on signal propagation bring difficulties to this method. In this paper, an empirical wireless channel model in human environment is proposed. When tracking human, this paper derives a measurement model from empirical signal model and a transition model of human movement, which are used by a particle filter. The algorithm estimates positions of human sequentially and is insensitive to signal noise. Simulation and experiment results suggest that our method can improve the accuracy of human tracking.

**Keywords:** Wireless Sensor Network; Human Tracking; Received Signal Strength; Particle Filter

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