

## 无线传感器网络随机分布模型及覆盖控制研究

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摘要:

节点部署和覆盖控制是无线传感器网络中的一个基本问题, 在传感器节点随机、高密度部署的环境中, 通过数学模型和仿真实验证明了节点分布符合泊松分布特点, 并且量化了部署节点感知半径、密度与面积覆盖率、重覆盖的关系, 以及覆盖控制模型中, 在保证节点对监测区域有效覆盖前提下, 近似取得需要休眠节点数量, 为传感器节点在随机分布下实验和研究中关于节点部署和覆盖控制问题提供参考依据, 仿真表明该数学量化模型可以有效实现最少节点最大化面积覆盖和重网络覆盖。

关键词: 无线传感器网络; 随机分布; 覆盖控制; k重覆盖

## Wireless sensor network random distribution model and coverage control research

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**Abstract:**

The deployment and coverage of nodes is a fundamental problem in wireless sensor network, in the environment of nodes' random and high-density deployment, the mathematical model and simulation experiment proved the node distribution with Poisson distribution characteristics and quantified the perception of nodes deployed the radius, the density and area of coverage, the relationship of k-coverage, and the model of covered control. In the premise of ensuring the effective covering area of monitoring for node to obtain the number of dormancy nodes approximately, which provide a reference for the experiments of sensor node random distribution and researches about the nodes deployment and control reference problems, The simulation shows that the mathematic model can effectively achieve minimum nodes and maximize coverage area in network k-coverage.

**Keywords:** Wireless sensor networks; Random distribution; Coverage control; k-coverage

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