

## 分簇无线传感器网络中密度感知的自适应占空比机制的研究

作者: 胡倩, 陈新

单位: 温州大学

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摘要:

本文提出了一种密度感知的自适应簇内占空比机制: DAA-DC (Density Aware Adaptive Duty Cycle)。DAA-DC能够根据簇内节点密度, 自适应的将簇成员进行分组, 同一小组的簇成员的工作周期相同, 但与其他小组的工作周期不相重叠, 从而在不改变网络拓扑结构以及其他网络参数的前提下, 降低工作节点的密度, 减少冲突发生的概率, 提高网络吞吐量。我们将DAA-DC应用于S-MAC, 并在NS2网络仿真平台对其性能进行了仿真。仿真结果表明, DAA-DC能够有效地减少冲突的发生概率, 提高数据传输效率。

关键词: 无线传感器网络; 占空比; 分簇; 密度感知

## A Density Aware Adaptive Duty Cycle Scheme for Cluster-based Wireless Sensor Networks

**Author's Name:**

**Institution:**

**Abstract:**

This paper proposes a novel Density Aware Adaptive Duty Cycle (DAA-DC) scheme for cluster-based wireless sensor networks. DAA-DC is able to divide all the cluster members into proper number of groups evenly and adaptively according to the density of the cluster. All the cluster members of a certain group shares the same duty cycle schedule, while different groups follow different ones so that the "active" cycles of any duty cycle schedule does not overlap with others. In this way, DAA-DC can reduce the density of active nodes, and hence reduce the collision probability. Simulations have been conducted to evaluate the performance of DAA-DC. The results show that DAA-DC can considerably reduce the collision probability and improve data transmission efficiency.

**Keywords:** wireless sensor networks; duty cycle; cluster-based; density aware

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