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基于DPSO的智能WSN分簇路由算法

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摘　要：

本文主要针对无线传感网络经典分簇协议LEACH (Low Energy Adaptive Clustering Hierarchy)中存在的三个使能量消耗过大的问题，提出了一种新的智能无线传感网络分簇路由算法DPSO—CR(Discrete Particle Swarm Optimization—Clustering Routing)。针对LEACH中分簇不均匀的问题，提出用改造后的离散粒子群优化DPSO)直接计算全局最优簇首的位置，使簇结构分布均匀合理；针对LEACH簇首与基站单跳通信能量消耗过大的问题，本文根据能量传输代价作为权值计算每个簇首到基站的多跳最小能耗路径；针对LEACH按轮进行全局簇首重选机制带来能耗过大的问题，本文提出了局部簇首更新机制来进一步节省能量消耗。实验结果表明，与LEACH协议相比，DPSO—CR算法不但分簇结构合理均匀，网络的生命周期也大大延长。

关键词：:LEACH，DPSO—CR，多跳最小能耗路径，全局最优簇首，局部簇首更新

Intelligent Clustering Algorithm of WSN Based on DPSO

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Abstract:

This paper presents a new intelligent clustering routing algorithm of WSN(Wireless Sensor Network), DPSO—CR(Discrete Particle Swarm Optimization—Clustering Routing), to solve three major problems that can consume energy heavily in LEACH(Low Energy Adaptive Clustering Hierarchy), a classical clustering protocol in WSN. To solve the problem of uneven clustering in LEACH, this paper proposes to calculate the positions of global best cluster heads to make the clustering structure even through modified DPSO. To solve the heavy energy consumption of one-hop communication between cluster head and base station in LEACH, this paper proposes to calculate multi-hop minimum energy consumption path between each cluster head and base station. To solve the the heavy energy consumption of global cluster heads re-election mechanism, this paper proposes local cluster heads update mechanism to save the energy consumption further. The experiment shows in comparison with LEACH, DPSO—CR not only has a reasonable and even cluster, the lifetime of network is also prolonged greatly.

Keywords: LEACH, DPSO—CR, multi-hop minimum energy consumption path, global best cluster heads, local cluster heads update mechanism.

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