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基于离散**PSO**的分层多链无线传感器网络路由算法

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摘　要：

针对无线传感器网络节点能量有限的特点，在PEGASIS协议的基础上提出了一种基于离散粒子群优化算法的分层多链无线传感器网络路由算法DPSO-MCRA。此算法把网络分为两层，通过离散粒子群优化算法建立多条低层链路来遍历所有节点；高层节点则自发地根据剩余能量以及到基站距离的平方大小竞争父簇头，依次选择最近的邻居链节点作为该链簇头，并由这些簇头节点组建簇头链。仿真结果表明，本文提出的路由算法与PEGASIS、GASA、ECR相比能显著缩短通信距离，减少和均衡能量消耗，并降低网络时延，从而延长了网络的生命周期。

关键词：无线传感器网络；PEGASIS；离散PSO；多旅行商问题

DPSO-based Multi-Layered Chain Routing Algorithm for WSN

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Abstract:

Considering the limited energy of sensor nodes in wireless sensor network， this paper proposes a new routing algorithm for wireless sensor networks according to PEGASIS called the DPSO-based multi-layered chain routing algorithm for WSN. This algorithm divides WSN into two layers. It establishes multiple low-level chains which traverses all the nodes by DPSO. According to its residual energy and the square of transmission distance from base station at high level every node, it independently makes its decision to compete for becoming the Cluster-head-leader, and selects closest node of neighbor chain as the chain's leader in turns, which forms a Cluster-head chain including all leader nodes of low-level chains. Simulation results demonstrate that compared with PEGASIS,GASA and ECR, this algorithm DPSO-MCRA can shorten total transmission distance significantly, which is also more efficient to save and balance energy of consumption. In the meanwhile it reduces the network delay and prolongs the living time of the whole network.

Keywords: wireless sensor network；PEGASIS；DPSO；MTSP

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