

应用粒子群优化分配WSN多目标跟踪节点任务

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摘要：

针对WSN多目标跟踪时传感器节点任务分配竞争冲突问题，提出一种基于最近邻的离散粒子群优化节点跟踪任务分配算法。通过构建多目标多传感器节点联盟跟踪任务分配问题的数学模型和目标函数，采用最近邻法对粒子群节点任务分配进行初始化，以目标函数作为适应值函数指引粒子飞行，快速实现节点优化配。实验表明：在节点覆盖较稀疏情况下，粒子群优化节点任务分配方法与最近邻方法相比，能耗大大减少，并能有效解决多目标跟踪节点任务分配冲突问题。PSO算法对于实际环境的WSN多目标跟踪具有优越性。

关键词：无线传感器网络；多目标跟踪；任务分配；粒子群优化

Using PSO to Realize Nodes Task Allocation of Multi-Target Tracking in WSN

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Abstract:

Aiming at the competition conflict in node task allocation of WSN Multi-target tracking, a discrete particle swarm optimization algorithm based on nearest neighbor is proposed. First, the mathematical model and objective function on multi-target tracking node task allocation is constructed. Then the node task allocation in PSO is initial with nearest neighbor algorithm, the objective function is taken as fitness function to guide particles flying and nodes optimal allocation can be achieved quickly. Experimental results show that the energy consumption based on PSO is reduced greatly compared with the classical nearest neighbor method. The PSO method can effectively solve the problem of the competition conflict in MTT node task allocation and the increment of system energy consumption when dynamic coalitions compete for the resource of sensor nodes. The best compromise of system power and precision is achieved. PSO algorithm has the advantage for the practical application WSN multi-target tracking.

Keywords: wireless sensor networks (WSN); multi-target tracking (MTT); task allocation; particle swarm optimization (PSO)

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