

论文与技术报告

认知无线网络中基于功率有效性的最优功率分配

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摘要:

在资源受限的认知无线网络中, 如何提高次用户网络的功率利用率是一个值得考虑的问题。针对这个问题, 本文首先提出了认知无线网络中基于功率有效性的次用户最优功率分配算法, 该算法不仅考虑主用户网络中断概率对次用户发射功率的限制, 而且兼顾次用户网络本身的中断概率要求。其次, 为了进一步降低节点的计算复杂度, 本文通过降维处理将目标最优化问题转化为两个子问题进行求解, 从而提出一种次优的低复杂度功率分配算法。仿真结果表明, 次优算法相比最优算法仅带来有限的性能损失, 但是却有效地节省了计算时间和存储空间; 此外, 当中继节点靠近源节点时更有利于系统功率效率的提高, 源节点到目的节点链路相比中继链路对系统的性能影响更大。

关键词: 认知无线网络; 协作传输; 功率消耗; 功率分配

Optimal Power Allocation based on Power Efficiency in Cognitive Radio Networks

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Abstract:

In resource-constrained cognitive radio networks, how to improve the power efficiency of sub-user network is a question worth considering. To address this problem, we first proposed the optimal power allocation algorithm based on the power efficiency of the sub-users in cognitive radio networks. The algorithm not only considers the limit of primary network outage probability on secondary users transmit power, but also the outage probability requirements of secondary network itself at the same time. Second, to further reduce the computational complexity of the nodes, we presents a low complexity suboptimal power allocation algorithm by reducing the dimension of the objective optimization problem, converting it into two sub-problems so as to be solved conveniently. Finally, the simulation shows that compared to optimal algorithm the sub-optimal algorithm brings only limited performance loss, but saves the computing time and storage space effectively; In addition, when the relay node is close to the source node, it is more conducive to improve the power efficiency of the whole system, and the link of source node to the destination than the relay link has a greater impact on system performance.

Keywords: cognitive radio networks cooperative transmission power consumption power allocation

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