

论文

无线传感器网络中协作ARQ协议能量效率分析及优化

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摘要:

文章研究了无线传感器网络中协作自动请求重传 (Cooperative Automatic Repeat Request, CARQ) 协议的能... 定义协议的能量效率为单位能耗所支持的分组成功传输的个数, 导出了CARQ协议和传统ARQ协议的能量效率表达式以及CARQ协议相对ARQ协议的能效增益表达式, 依此对两协议的能量效率进行了仿真研究, 发现协作节点的位置对协议的能量效率有重要影响, 当通信距离大于“门限距离”时, CARQ协议的能量效率才高于传统ARQ协议能效; 进而提出了一种离散优化算法, 通过优化调制水平, 大大提高了CARQ协议的能效及能效增益。

关键词: 无线传感器网络 协作分集 自动请求重传 能量效率

The Optimum of Energy Efficiency of Cooperative ARQ Protocol in Wireless Sensor Networks

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Abstract:

The issue of optimizing energy efficiency of cooperative Automatic Repeat Request protocol (CARQ) in wireless sensor networks is studied in this paper. Energy efficiency of CARQ protocol is defined as the number of data packets received successfully at the destination node per the unit of energy cost. The expressions of energy efficiency of CARQ and traditional ARQ protocol are deduced respectively and the energy efficiency gain of CARQ protocol compared with ARQ protocol is also derived in which the energy efficiency of them are compared with each other. Simulation results show that the position of the relay node has an important effect on the energy efficiency of the CARQ protocol and the CARQ protocol provides better energy efficiency than ARQ protocol when the communication distance is bigger than the threshold of the distance. At last, a discrete optimization algorithm optimizing the modulation level is proposed, by which energy efficiency and its gain of CARQ protocol can be enhanced greatly.

Keywords: wireless sensor networks cooperative diversity ARQ energy efficiency

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