Performance Analysis of a Priority Scheduling Method in Wireless Body Sensor Networks With Energy Harvesting

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Wireless Body Area Network [1] is a promising low power technology that enables the communications between body area sensor nodes and a central coordinator, which will be beneficial to many medical and non-medical applications and services, such as health and stress monitoring, management of chronic diseases and sports and fitness tracking etc. However, the energy of sensor node and its computing ability are quite limited, so the major hurdle for the wide adoption of WBSNs technology are the energy supply and efficient energy managements. Therefore, the energy efficiency of the system and the prioritized scheduling of emergency packets are the pretty important requirements in WBANs.

In my research, I study the priority scheduling [2] to make full use of energy to ensure the transmission of emergency information and introduce the energy harvesting [3] or energy scavenging as a promising approach to deal with the energy supply problem for WBSNs. For one thing, patients or doctors generally care more about the current sensed information compared with the buffered information in the queue. Thus, we designed a waiting-time based priority, which means the packets will be sensitive to its waiting time in the system, and its priority is a dynamic value of time variable $n$ which is followed a predefined function. For another thing, ignoring the implementation details of harvesting methods, we could simply model the harvesting procedure as a Phase-Type distribution process on the sensors with limited energy storage ability. We simulate and analyze the performance of the developed scheduling policy, and also compare it with other controlling methods in WBANs.

REFERENCES


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