Energy-Efficient and Distributed Network Management Cost Minimization in Opportunistic Wireless Body Area Networks

ABSTRACT

- Mobility induced by limb/body movements in Wireless Body Area Networks (WBANs) significantly affects the link-quality of intra-BAN and inter-BAN communication units, which, in turn, affects the Quality-of-Service (QoS) of each WBAN, in terms of reliability, efficient data transmission and network throughput guarantees. Further, the variation in link-quality between WBANs and Access Points (APs) makes the WBAN-equipped patients more resource-constrained in nature, which also increases the data dissemination delay.
- Therefore, to minimize the data dissemination delay of the network, WBANs send patients' physiological data to local servers using the proposed opportunistic transient connectivity establishment algorithm. Additionally, limb/body movements induce dynamic changes to the on-body network topology, which, in turn, increases the network management cost and decreases the life-time of the sensor nodes periodically.

CONT…

- Also, mutual and cross technology interference among coexisting WBANs and other radio technologies increases the energy consumption rate of the sensor nodes and also the energy management cost.
- To address the problem of increased network management cost and data dissemination delay, we propose a network management cost minimization framework to optimize the network throughput and QoS of each WBAN. The proposed framework attempts to minimize the dynamic connectivity, interference management, and data dissemination costs for opportunistic WBAN.
- We have, theoretically, analyzed the performance of the proposed framework to provide reliable data transmission in opportunistic WBANs. Simulation results show significant improvement in the network performance compared to the existing solutions.

EXISTING SYSTEM

- Energy efficiency and network management cost minimization are two issues of primary concern in opportunistic WBANs, which are required to provide reliable and cost-effective healthcare services to the critical patients.
- Therefore, several research works targeted to address these issues. We review some of the relevant existing works, which motivate us to specifically address these issues.

PROPOSED SYSTEM

- The numerical results of this study demonstrate that then proposed algorithm can converge to the optimum and remarkably reduce the data dissemination delay and total energy consumption, compared to the algorithm without concurrent opportunistic data gathering and power control.
- We present theoretical analysis and extensive simulation results to verify the convergence of the proposed algorithm and demonstrate that the proposed algorithm can achieve lower network management cost compared to the opportunistic data dissemination process.

Hardware requirements

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

SOFTWARE REQUIREMENTS

- Tool - Network Simulator-2
- Operating system - LINUX
- Front end - OTCL (Object Oriented Tool Command Language)

REFERENCES

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