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Abstract

Nowadays, Wireless Body Area Network (WBAN) is emerging very fast and so many new methods and algorithms are coming up for finding the optimal path for disseminating emergency messages. Ant Colony Optimization (ACO) is one of the cultural algorithms for solving many hard problems such as Travelling Salesman Problem (TSP). ACO is a natural behavior of ants, which work stochastically with the help of pheromone trails deposited in the shortest route to find their food. This optimization procedure involves adapting, positive feedback and inherent parallelism. Each ant will deposit certain amount of pheromone in the tour construction it makes searching for food. This type of communication is known as stigmetric communication. In addition, if a dense WBAN environment prevails, such as hospital, i.e. in the environment of overlapping WBAN, game formulation was introduced for analyzing the mixed strategy behavior of WBAN. In this paper, the ant colony optimization approach to the travelling salesman problem was applied to the WBAN to determine the shortest route for sending emergency message to the doctor via sensor nodes; and also a static Bayesian game formulation with mixed strategy was analyzed to enhance the network lifetime. Whenever the patient needs any critical care or any other medical issue arises, emergency messages will be created by the WBAN and sent to the doctor's destination. All the modes of communication were realized in a simulation environment using OMNet++. The authors investigated a balanced model of emergency message dissemination and network lifetime in WBAN using ACO and Bayesian game formulation.

***Keywords*:** Wireless Body Area Network; Ant Colony Optimization; Bayesian Game Model; Sensor Network; Message Latency; Network Lifetime