Cluster based routing protocol for mobile nodes in wireless sensor network

ABSTRACT

Mobility of sensor nodes posed new challenges particularly in energy consumption and demands researchers' attention. Some real applications impose combined environments of fixed and mobile sensor nodes in the same network, while others demand a complete mobile sensors environment. Packet loss that occurs due to mobility of the sensor nodes is one of main challenges in Wireless Sensor Network (WSN) and it comes in parallel with energy consumption. In this paper, we propose adaptive Time Division Multiple Access (TDMA) scheduling and round free cluster head protocol called Cluster Based Routing (CBR) protocol for Mobile Nodes in Wireless Sensor Network (CBR Mobile-WSN). In this protocol the cluster head receive data from not only its member during the TDMA allocated time slot but also other sensor nodes that just enter the cluster when it has free time slots, each cluster head takes turn to be the free cluster head in the network. CBR Mobile-WSN change TDMA scheduling adaptively according to traffic and mobility characteristics. The proposed protocol sends data to cluster heads in an efficient manner based on received signal strength. The performance of proposed CBR Mobile-WSN protocol is evaluated using MATLAB and it has been observed that the proposed protocol reduces the packet loss by 25% compared to LEACH-Mobile protocol.

Keyword: Cluster based routing; LEACH; LEACH-mobile; Mobility; WSN