An Energy-Balanced Clustering Method on Wireless Sensor Networks

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Abstract : In recent years, due to the development of wireless network technology, many researchers have devoted to the study of wireless sensor networks. The applications of wireless sensor network mainly use the sensor nodes to collect the required information, and send the information back to the users. Since the sensed area is difficult to reach, there are many restrictions on the design of the sensor nodes, where the most important restriction is the limited energy of sensor nodes. Because of the limited energy, researchers proposed a number of ways to reduce energy consumption and balance the load of sensor nodes in order to increase the network lifetime. In this paper, we proposed the Energy-Balanced Clustering method with Auxiliary Members on Wireless Sensor Networks〔EBCAM〕based on the cluster routing. The main purpose is to balance the energy consumption on the sensed area and average the distribution of dead nodes in order to avoid excessive energy consumption because of the increasing in transmission distance. In addition, we use the residual energy and average energy consumption of the nodes within the cluster to choose the cluster heads, use the multi hop transmission method to deliver the data, and dynamically adjust the transmission radius according to the load conditions. Finally, we use the auxiliary cluster members to change the delivering path according to the residual energy of the cluster head in order to its load. Finally, we compare the proposed method with the related algorithms via simulated experiments and then analyze the results. It reveals that the proposed method outperforms other algorithms in the numbers of used rounds and the average energy consumption.