



OPTIMAL SINK NODE ALLOCATION FOR BALANCING COMMUNICATION LOAD IN A WIRELESS SENSOR NETWORK

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Abstract- Wireless sensor networks are attracting attention as network technology that is essential to the expansion of the ICT society. One of the challenges facing the implementation of wireless sensor networks is the problem of load concentrations at local sensor nodes. Sink node allocation methods have recently been proposed to resolve this problem, but they do not solve the problem of the dramatic deterioration in operating times caused by an increase in the sensor nodes. This paper proposes a drive-control type of sink node allocation method to distribute the load on sensor nodes. By using an improved sequential activation method and the artificial bee colony algorithm, which is a type of swarm intelligence algorithm, we assign sensor nodes that should be driven on the network and perform appropriate control of their communications radii. The results of evaluation experiments done by computer simulation have confirmed that the proposed method provides sink node allocation candidates within a large-scale sensor network environment that can implement greater power saving performances and extended operating times in comparison with conventional methods.

Index terms: sensor networks, power saving, load balancing, sink node allocation problem