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Wireless Sensor Networks Optimization by Using 2-Stage Algorithm Based on Imperialist Competitive Algorithm

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Abstract : Wireless sensor networks (WSN) have become progressively popular due to their wide range of applications. Wireless Sensor Network is made of numerous tiny sensor nodes that are battery-powered. It is a very significant problem to maximize the lifetime of wireless sensor networks. In this paper, we propose a two-stage protocol based on an imperialist competitive algorithm (2S-ICA) to solve a sensor network optimization problem. The energy of the sensors can be greatly reduced and the lifetime of the network reduced by long communication distances between the sensors and the sink. We can minimize the overall communication distance considerably, thereby extending the lifetime of the network lifetime through connecting sensors into a series of independent clusters using 2SICA. Comparison results of the proposed protocol and LEACH protocol, which is common to solving WSN problems, show that our protocol has a better performance in terms of improving network life and increasing the number of transmitted data.

Keywords : wireless sensor network, imperialist competitive algorithm, LEACH protocol, k-means clustering
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