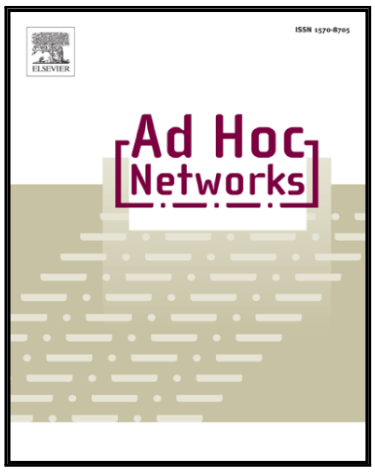

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A Grid-Based Reliable Routing Protocol for Wireless Sensor Networks with Randomly Distributed Clusters

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Abstract

The need for implementing reliable data transfer in wireless sensor networks is still an open issue in the research community. Although cluster routing schemes are characterized by their low overhead and efficiency in reliable data transfer in traditional wireless sensor network, this potential is still yet to be utilized for viable routing options in the environment with obstacles and voids, via greedy and perimeter forwarding. In this paper, a novel Grid-Based Reliable Routing (GBRR) technique is presented. This is achieved by the creation of virtual clusters based on square grids from which the next hop choice is made based on intra-cluster and inter-cluster communication quality. The simulation result shows that the developed scheme can make more advancement to the BS as against the usual decisions of relevant clustering route select operations, while ensuring channel quality. Further simulation results have shown the enhanced reliability, lower latency and energy efficiency of the presented scheme with randomly nodes and obstacles distribution.

Keywords: wireless sensor networks; routing protocol; grid-based; clustering; random distribution; greedy algorithm

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