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Energy Efficient Fault Tolerant Sensor Node Failure Detection in WSNs

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Abstract

In WSNs, the large numbers of portable sensor nodes are deployed randomly and can fail due to battery problem, environmental conditions or are unattended. Faulty sensor node detection techniques are mainly affected due to energy consumption of sensor nodes in WSNs. Therefore, the primary goal of this investigation is to design energy efficient fault tolerant sensor node failure detection. A faulty sensor node is detected by measuring the Round Trip Delay (RTD) times of Round Trip Paths (RTPs) in WSNs. Fault tolerance is achieved by assigning unique source node or Cluster Head (CH) for each RTP in WSNs. Energy consumed by individual sensor node is minimized due to optimal involvement of sensor nodes in the detection process. The proposed method is implemented and tested on WSNs with six sensor nodes.

Keywords: Faulty tolerance, RTD, Energy efficient, RTPs, Unique source node, WSNs.

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