

## **RRSEB: a reliable routing scheme for energy-balancing using a self-adaptive method in wireless sensor networks**

### ABSTRACT

Over recent years, enormous amounts of research in wireless sensor networks (WSNs) have been conducted, due to its multifarious applications such as in environmental monitoring, object tracking, disaster management, manufacturing, monitoring and control. In some of WSN applications dependent the energy-efficient and link reliability are demanded. Hence, this paper presents a routing protocol that considers these two criteria. We propose a new mechanism called Reliable Routing Scheme for Energy-Balanced (RRSEB) to reduce the packets dropped during the data communications. It is based on Swarm Intelligence (SI) using the Ant Colony Optimization (ACO) method. The RRSEB is a self-adaptive method to ensure the high routing reliability in WSNs, if the failures occur due to the movement of the sensor nodes or sensor node's energy depletion. This is done by introducing a new method to create alternative paths together with the data routing obtained during the path discovery stage. The goal of this operation is to update and offer new routing information in order to construct the multiple paths resulting in an increased reliability of the sensor network. From the simulation, we have seen that the proposed method shows better results in terms of packet delivery ratio and energy efficiency.

**Keyword:** Reliability; Energy efficient; Energy balancing; Link failure; Swarm intelligence