

**ANT COLONY OPTIMIZATION BASED QUALITY OF SERVICE AWARE  
ENERGY BALANCING SECURE ROUTING ALGORITHM FOR WIRELESS  
SENSOR NETWORKS**

**ABSTRACT**

Existing routing protocols for wireless sensor networks (WSNs) focus primarily either on energy efficiency, quality of service (QoS), or security issues. However, a more holistic view of WSNs is needed, as many applications require both QoS and security guarantees along with the requirement of prolonging the lifetime of the network. The limited energy capacity of sensor nodes forces a tradeoff to be made between network lifetime, QoS, and security. To address these issues, an ant colony optimization based QoS aware energy balancing secure routing (QEBSR) algorithm for WSNs is proposed in this project. Improved heuristics for calculating the end-to-end delay of transmission and the trust factor of the nodes on the routing path are proposed. The proposed algorithm is compared with two existing algorithms: distributed energy balanced routing and energy efficient routing with node compromised resistance.