

## **Algorithm for Designing Energy-efficient Wireless Sensor Networks**

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This paper proposes effective algorithms for designing wireless sensor network systems in railway infrastructures. Firstly, we reviewed several optimization scenarios arising in railway system and highlighted the importance of the relay node and the gateway deployment for constructing energy-efficient wireless sensor networks for monitoring railway infrastructures. Lagrangean heuristic algorithm for the relay node configuration and life span algorithm for the gateway deployment issues have been suggested in this paper. Finally the proposed algorithms have been verified with randomly generated data and the railway tunnel field measurements.