IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, May 2025
Impact Factor: 7.67

Transmission of Multimedia in Wireless Sensor Networks using Cross-layer Optimization

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Abstract: *Transmission of multimedia data in wireless sensor networks (WSNs) presents unique challenges and considerations due to the resource-constrained nature of these networks. Wireless sensor networks are typically composed of numerous small, low-power, and low-cost sensor nodes that collaborate to gather and transmit data from their surroundings. To overcome this issue this paper proposes a novel approach for multimedia transmission in WSNs through cross-layer optimization for cluster head selection and optimal routing of multimedia data without delay. The proposed methodology integrates Particle Swarm Optimization (PSO), Wolf Search Algorithm (WSA), and Cat Swarm Optimization (CSO) into a unified framework known as the Particle Cat Wolf Optimization (PCWO) model. PCWO is designed to enhance network clustering methods, offering robust solutions for the efficient transmission of multimedia data within WSNs. The synergistic integration of these optimization algorithms harnesses their collective strengths, enabling improved resource allocation, data routing, and network performance. By employing PCWO, this research advances the capabilities of WSNs in handling multimedia traffic, contributing to the development of more reliable and efficient wireless sensor networks with both energy efficiency and minimum data transmission delay..*

Keywords: Wireless Sensor Network, Cross-Layer Optimization, Particle Cat Wolf Optimization, Network clustering, Optimal data routing

DOI: 10.48175/IJARSCT-26137