

IoT-Based Optimization of Water Resource Management Using Neural Networks and Metaheuristics

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Abstract: The management of water resources has become an increasingly critical challenge due to the rising demand and climate change impacts. Internet of Things (IoT) technologies provide an effective means of optimizing water resource management by enabling real-time data collection and analysis. This study investigates the integration of neural networks and metaheuristic algorithms for efficient water resource allocation and usage optimization. The approach utilizes IoT-based sensors to collect data on water levels, usage rates, and environmental factors. Neural networks are applied for pattern recognition and prediction, while metaheuristic techniques are employed to optimize resource distribution. The proposed system aims to improve water conservation, reduce waste, and ensure equitable water distribution. The results demonstrate that the combined use of IoT, neural networks, and metaheuristics can significantly enhance water management efficiency, making it adaptable to various real-world scenarios.

Keywords: IoT, neural networks, metaheuristics, water resource management, optimization, real-time data.

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