

## **ANALYSIS OF ENERGY EFFICIENCY IN SENSOR NODES OF WSN SCADA SYSTEMS USING COGNITIVE FUZZY LOGIC**

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### **ABSTRACT**

Wireless Sensor Networks (WSN) provides an effective way to sense, analyze and transmit the data with the collection of sensor nodes. The lifetime of the WSNs are prolonged by using adequate clustering process. In general, clustering forms an efficient way to reduce the energy consumption of the sensor networks. The main requirement of sensor network is to preserve energy by increasing the network lifetime and efficiency. SCADA systems are primary control systems which can organize variety of manufacturing operations and industrial environments. The data is captured by the WSN sensor nodes and is allowed to communicate within the central controller which evaluates the data and proceed towards appropriate actions. The main objective of this paper is to enhance the energy efficiency and network lifetime with use of fuzzy based systems. This system focused its attention on reducing the transmission paths between sensor nodes and sink nodes by maintaining minimum number of multihop communications. The use of cognitive fuzzy systems achieves multiparametric fuzzy decision routing. The simulation results show that the fuzzy based algorithm efficaciously increases the lifetime of the network and achieves high energy efficiency compared to other protocols.

**KEYWORDS:** WSN, SCADA, Multihop, Cognitive Fuzzy Systems, Energy Efficiency, Packet Delivery Ratio, Delay Time