

## An Enhanced AODV Routing Protocol for Wireless Sensor and Actuator Networks

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**Abstract :** An enhanced ad-hoc on-demand distance vector routing (E-AODV) protocol for control system applications in wireless sensor and actuator networks (WSANs) is proposed. Our routing algorithm is designed by considering both wireless network communication and the control system aspects. Control system error and network delay are the main selection criteria in our routing protocol. The control and communication performance is evaluated on multi-hop IEEE 802.15.4 networks for building-temperature control systems. The Gilbert-Elliott error model is employed to simulate packet loss in wireless networks. The simulation results demonstrate that the E-AODV routing approach can significantly improve the communication performance better than an original AODV routing under various packet loss rates. However, the control performance result by our approach is not much improved compared with the AODV routing solution.

**Keywords :** WSANs, building temperature control, AODV routing protocol, control system error, settling time, delay, delivery ratio

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