Research and evaluation of the routing protocol RASeR for wireless sensor networks

Nguyen Van Hoat

Abstract: This thesis investigates and evaluates the performance of the RASeR (Robust Ad-hoc Sensor Routing) protocol for wireless sensor networks (WSNs). RASeR is a lightweight, geographic routing protocol designed for highly dynamic and resource-constrained environments. The study focuses on assessing its effectiveness in terms of packet delivery ratio, end-to-end delay, energy consumption, and network scalability. Through extensive simulations using the OMNeT++ framework, the protocol's performance is benchmarked against established routing protocols such as AODV and GPSR. The results demonstrate that RASeR significantly reduces routing overhead and energy consumption while maintaining a high packet delivery ratio, particularly in scenarios with high node mobility and sparse network density. Furthermore, the analysis reveals the protocol's inherent resilience to link failures due to its stateless, receiver-based forwarding mechanism. The findings confirm that RASeR is a highly efficient and robust solution for mission-critical WSN applications, offering a superior trade-off between reliability and energy efficiency compared to traditional table-driven or on-demand approaches.

Keywords: RASeR, routing protocol, wireless sensor network, efficiency