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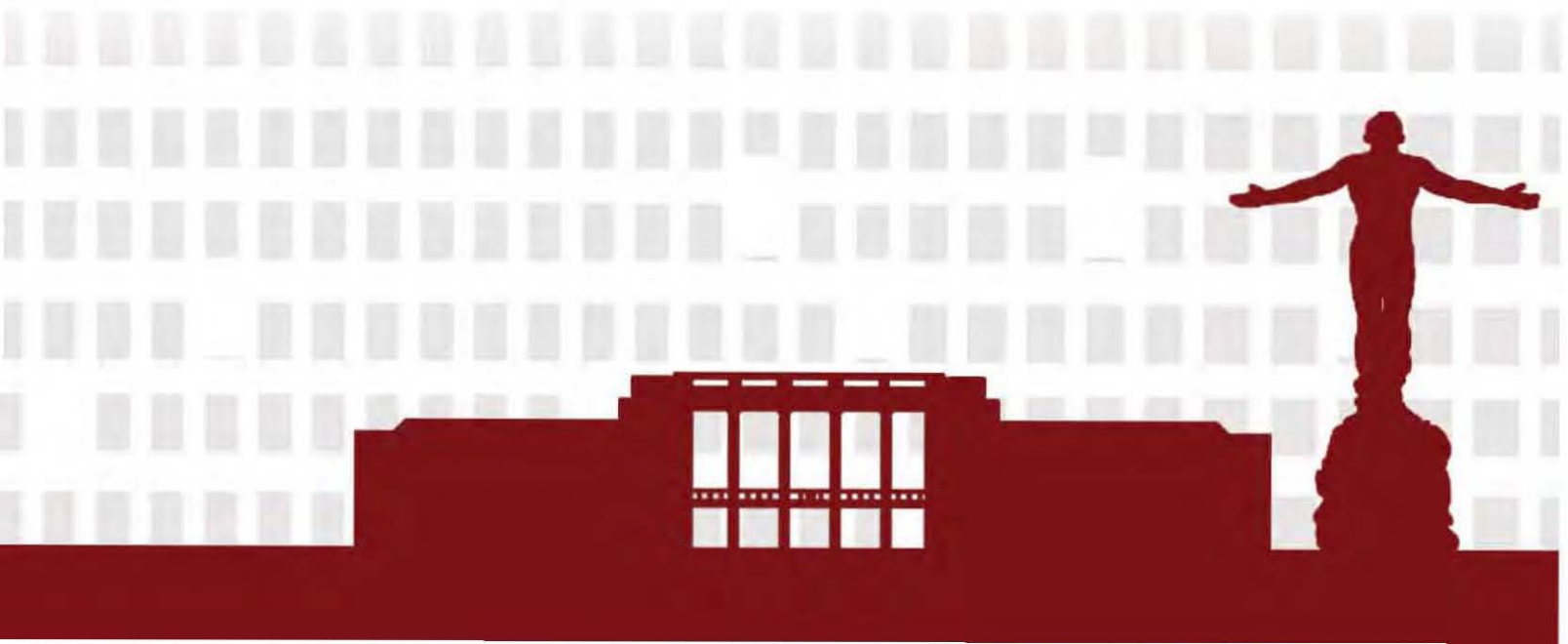

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OPTIMIZING THE TRICKLE ALGORITHM OF RPL ON DENSE WIRELESS SENSOR NETWORKS

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ABSTRACT

Wireless sensor networks with resource constraints are called low power and lossy networks (LLN). LLNs are used in smart grids and advanced metering infrastructures (AMI) which are deployed on dense areas. This introduces problems such as packet loss and node loss. The Internet Engineering Task Force (IETF) designed the Routing Protocol for Low Power and Lossy Networks (RPL) which is an IPv6 routing protocol to resolve issues encountered by LLNs. It uses a Destination Oriented Directed Acyclic Graph (DODAG) to for its topology which creates no loops and uses an objective function to decide the nodes' path toward the sink node. RPL also employs the trickle algorithm in sending control packets within the network. However, application of RPL on dense WSNs degrades the expected performance and improvements are necessary to meet the required outcome. We are to evaluate its performance on dense networks through simulations using COOJA simulator on Contiki OS and to improve its performance by proposing a new algorithm for getting the values of its trickle timer parameters.

Keywords: RPL, WSN, Dense Networks, Contiki, Scalability