# OPNET implementation of the GeoAODV routing protocol

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## Abstract

This work describes the design of the Geographical AODV (GeoAODV) routing protocol and its implementation using the OPNET Modeler network simulation package. GeoAODV is a new protocol for simple and efficient location-based routing in mobile ad hoc wireless networks (MANET). GeoAODV uses the last known destination's GPS coordinates to estimate possible location of the destination node. Based on the approximated location of the destination node, GeoAODV limits the route discovery flooding area to a region that is likely to contain the path to the destination. Only those nodes that are located within the region on the path to the destination node will forward route request messages, while all the other nodes will simply discard them. Such a technique significantly reduces the overall number of control messages that traverse the network during the route discovery process which makes the GeoAODV protocol more efficient than regular AODV. OPNET Modeler is a popular network simulation software package that provides a flexible and accurate platform for evaluating performance of a variety of networking technologies. We used OPNET Modeler to study the GeoAODV protocol and to compare its performance with that of the regular AODV routing protocol. This work provides the details of our GeoAODV implementation which includes a description of the data structures and the process models that have been created and modified within OPNET Modeler. Additionally, we discuss the existing implementation of the AODV protocol, modifications of the **aodv_rte** process model that accommodate GeoAODV features, and a performance comparison of the route discovery phases of the AODV and GeoAODV protocols.