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## **Title**

Simulating a Universal Geocast Scheme for Vehicular Ad Hoc Networks

## **Authors**

**Benjamin L. Bovee**, *University of Massachusetts Amherst Follow*

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## Abstract

Recently a number of communications schemes have been proposed for Vehicular Ad hoc Networks (VANETs). One of these, the Universal Geocast Scheme (UGS) proposed by Hossein Pishro-Nik and Mohammad Nekoui, provides for a diverse variety of VANET-specific characteristics such as time-varying topology, protocol variation based on road congestion, and support for non line-of-sight communication. In this research, the UGS protocol is extended to consider inter-vehicle multi-hop connections in intersections with surrounding obstructions along with single-hop communications in an open road scenario. Since UGS is a probabilistic, repetition-based scheme, it supports the capacity-delay tradeoffs crucial for periodic safety message exchange. The approach is shown to support both vehicle-to-vehicle and vehicle-to-infrastructure communication. This research accurately evaluates this scheme using network (NS-2) and mobility (SUMO) simulators, verifying two crucial elements of successful VANETs, received packet ratio and message delay. A contemporary wireless radio propagation model is used to augment accuracy. Results show a 6% improvement in received packet ratio in intersection simulations combined with a decrease in average packet delay versus a previous, well-known inter-vehicle communication protocol.

## First Advisor

Russell Tessier

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