

BIOGRAPHICAL SKETCH

B.S. 2009, Florida Gulf Coast University, Ft. Myers, Florida
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CONCERNING PERIOD OF PREPARATION & QUALIFYING EXAMINATION

Time in Preparation: 2010—2017

Qualifying Examination Passed: Spring 2011

Published Papers:

Joanne Skiles, Imad Mahgoub, “A geographical hybrid solution for Inter-Vehicular Communication in VANET”, *Proceedings of 2016 IEEE International Wireless Communications and Mobile Computing Conference (IWCMC)*, September 2016.

Joanne Skiles, Imad Mahgoub, “Investigating the Impact of Adaptive Beaconing on GEOADV Performance”, *Proceedings of the 15th IEEE International Conference on Pervasive Intelligence and Computing (PICom2017)*, 2017 (Under Review).



COLLEGE OF ENGINEERING
& COMPUTER SCIENCE

Florida Atlantic University

FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

announces the

Ph.D. Dissertation Defense

of

JOANNE SKILES

for the degree of

DOCTOR OF PHILOSOPHY (PH.D.)

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777 Glades Road

Boca Raton, FL

ABSTRACT OF DISSERTATION

DEPARTMENT: Computer & Electrical Engineering and
Computer Science

DISSERTATION TITLE: "Adaptive Routing Protocols for
VANET"

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Routing protocols in VANETs rely on the ability to satisfy the throughput and delivery requirements of applications running on the network. Currently, most of the proposed VANET routing protocols focus on urban or highway environments. This dissertation addresses the need for an adaptive routing protocol in VANETs, which is able to tolerate low and high-density network traffic with little throughput and delay variation.

This dissertation proposes three Geographic Ad-hoc On-Demand Distance Vector (GEOADV) protocols. The GEOADV routing protocols are designed to address the lack of flexibility and adaptability in current VANET routing protocols. The first protocol, GEOADV, is a hybrid geographic routing protocol. The second protocol, GEOADV-P, enhances GEOADV by introducing predictive features. The third protocol, GEOADV-PF improves optimal route selection by utilizing fuzzy logic in addition to GEOADV-P's predictive capabilities.

GEOADV and GEOADV-P's adaptive performance has been confirmed by both urban and highway simulation results. When compared to existing routing protocols, GEOADV and GEOADV-P lead to less average delay and higher average delivery. GEOADV-PF is introduced to improve GEOADV and GEOADV-P performance in sparser networks. The introduction of fuzzy systems can help with the intrinsic demands for flexibility and adaptability necessary for VANETs.

An investigation into the impact that adaptive beaconing has on the GEOADV protocol is conducted. GEOADV enhanced with an adaptive beacon method is compared against GEOADV with three fixed beacon rates. Our simulation results show that the adaptive beaconing scheme is able to reduce routing overhead, increase the average delivery ratio, and decrease the average delay.