

الآية

قال تعالى:

((قُلْ لَوْ كَانَ الْبَحْرُ مِدَادًا لِكَلِمَاتِ رَبِّي لَنَفِدَ الْبَحْرُ قَبْلَ أَنْ تَنفَدَ كَلِمَاتُ رَبِّي وَلَوْ جِئْنَا بِمِثْلِهِ مَدَدًا))

صدق الله العظيم

سورة الكهف الآية (109)

Dedication

I dedicate this thesis to:

My mother and the soul of my father

My Brothers, sisters

And to everybody who supported me.

Acknowledgments

I would like to thank my teacher **Mohammed abaker**, and a lot of thanks for my doctor (supervisor)**Dr. Fath Elrahman Ismail** for their support and good advices during the whole process. I also want to thank my fellow students for their critical reviews and advices.

المستخلص

شبكات الاتصالات اللاسلكية عبر المركبات هي شبكات ذات تنظيم ذاتي. فهي بيئة الشبكات اللاسلكية القادمة لأنظمة التشغيل الذكية. شبكات الاتصالات اللاسلكية عبر المركبات يمكن أن تحقق التطور في الحركة المثالية دون الحاجة إلى بنية تحتية ثابتة أو نظام إدارة مركزي. انتشار البيانات في بيئة الاتصالات اللاسلكية المتحركة تحدي كبير، وذلك للتغير المطرد في البنية التركيبية للشبكة نتيجة للتغير المستمر في بنية الشبكة، والاختلاف في أنواع ونماذج الحركة من أجل التطبيقات التي تحتاج إلى سلامة وعناية خاصة في الإرسال. يعتبر إرسال هذه الأنواع من الرسائل أمر هام.

هذا المشروع نطرح مرسوما يحقق توزيع البيانات بموثوقية عالية. هذا البروتوكول يسمى OCG. وتم استخدام الماتلاب كأداة محاكاة وتم اخذ النتائج المطلوبة. وتكمن أهمية هذا البروتوكول في أنه يزيد من كفاءة توزيع البيانات ذات النطاق العريض بموثوقية الرسالة، نظرا لتوصيل الرسائل وتقليل التأخير. وهذا البروتوكول المقترح يزيد من موثوقية الرسالة بمقدار 40% ونسبة إرسال البيانات بمقدار 100%، بينما يحسن من الازدحام في الشبكة بمقدار 43%، ويحسن التأخير بنسبة 90%.

Abstract

Vehicular Ad hoc networks (VANETs) are self-organizing networks. They are the upcoming wireless network environment for intelligent transportation systems (ITS) . VANETs can significantly improve the traffic safety without requiring fixed infrastructure or centralized administration. However, data dissemination in VANET environment is a challenging task, mainly due to: rapid changes in network topology, the high dynamic of the network topology, different traffic type, and mobility patterns. For safety and emergency message applications, reliable message dissemination is an important key factor . In this thesis, it is proposed a new protocol for reliable message dissemination in vehicular ad hoc networks. This protocol is called optimal clustered geocast protocol (OCG) . The matlab is used for simulation and require results are taken. The efficiency of this protocol is measured in terms of reliability message, delivery ratio, overhead and latency . The advantage of the proposed protocol is increasement of the reliability of the message to 40% broadcasting rate to 100%, while it enhances congestion by 43% and delay by 93% respectively.

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Abbreviation

Abbreviation	Meaning
VANETs	Vehicular Ad hoc Networks
Geocast	Geographic Broadcast
OCG	Optimizing Cluster Geocast Protocol
OAG	Optimized Abiding Geocast Protocol
ID	Identifier Number
GPS	Global Positioning System
MAC	Medium Access Control
CBR	Constant Bit Rate
ETT	Expected Transmission Time

Symbols

Symbol	meaning
P_i	position of node i
P_j	position of node j
N	number of vehicles in cluster
P_c	position of coordinator vehicles
n	the number of vehicles(nodes)
D_{ij}	the distance between vehicle i and vehicle j
R	the transmission range
L	bandwidth of the link
S	size of packet
L	bandwidth of the link
T	the time when approaching vehicle i was informed
A	the number of informed approaching vehicles.
N_t	number of vehicles transmit message
N_{re}	number of nodes retransmit(rebroadcast)
N_r	number of vehicles receive message
N_{tr}	number of vehicles retransmit message
N_{tot}	number of vehicles in transmission range
N_{hid}	number of hidden vehicles
β	density of traffic(number of vehicles)
θ	wait time for a relay leaving or approaching the event

S_{max}	maximum allowable speed S .
S_{self}	vehicle speed
cur_{loc}	current location