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SEMI MARKOV BASED STOCHASTIC MODEL FOR SYNCHRONIZING VEHICULAR NODES FOR CO-OPERATION

Dr. N. Danapaquiame, Kiruba[1], Shankari.R[2], Sri Lakshmi.H[3], Harini.M[4], Massha Catherine.J[5]
Asso.Professor[1], B. Tech Student[2,3,4,5]
Department of Computer Science and Engineering
Sri Manakula Vinayagar Engineering College,

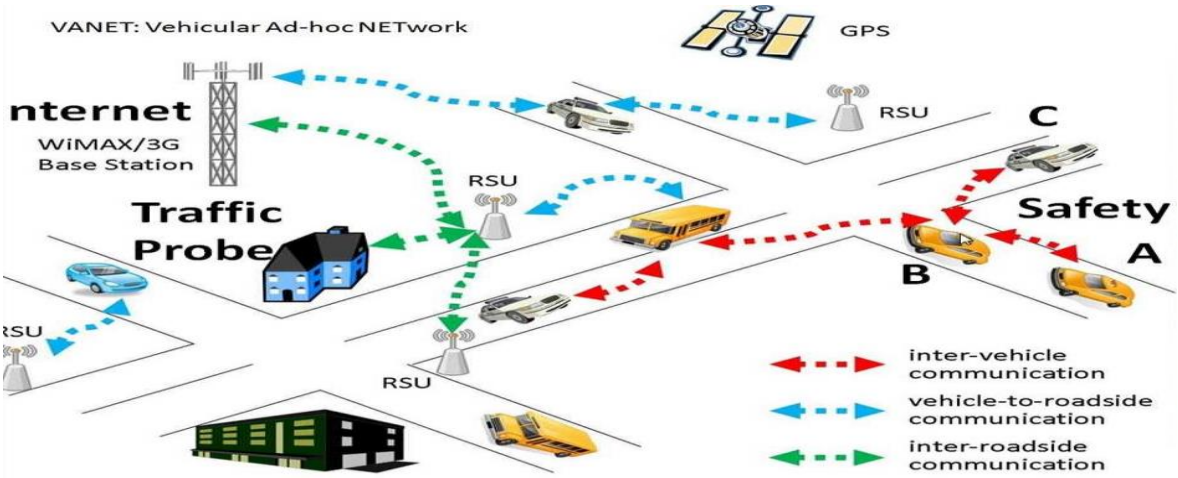
[1]kn.danapaquiame@gmail.com ,[2]kirubarathinavelu@gmail.com
[3]lak.aashi@gmail.com [4]harinimathivanan8@gmail.com
[5]masshacathey28@gmail.com

Abstract

The Vehicular Ad-Hoc Network, or VANET, is a technology that uses moves cars as nodes in a network to create a mobile network. VANET turns every participating car into a wireless router or node, allowing cars to connect and create a network with a wide range. In the existing system, a single hop information forecasting is made possible using Markov. The issue is Markov doesn't provide accurate value. So in Proposed system multi hop information forecasting is made possible Semi-Markov.

Introduction

Vehicular ad hoc networks (VANETs) are created by applying the principles of mobile ad hoc networks (MANETs) – the spontaneous creation of a wireless network for data exchange to the domain of vehicles. They are a key component of intelligent transportation systems (ITS).While, in the early 2000s, VANETs were seen as a mere one-to-one application of MANET principles, they have since then developed into a field of research in their own right. By 2015, the term VANET became mostly synonymous with the more generic term inter-vehicle communication (IVC), although the focus remains on the aspect of spontaneous networking, much less on the use of infrastructure like Road Side Units (RSUs) or cellular networks. The Vehicular Ad-Hoc Network, or VANET, is a technology that uses moves cars as nodes in a network to create a mobile network. VANET turns every participating car into a wireless router or node, allowing cars approximately 100 to 300 metres of each other to connect and, in turn, create a network with a wide range. As cars fall out of the signal range and drop out of the network, other cars can join in, connecting vehicles to one another so that a mobile Internet is created. It is estimated that the first systems that will integrate this technology are police and fire vehicles to communicate with each other for safety purposes.



Related works

[1] K. Abboud and W. Zhuang, "**Impact of node mobility on single-hop cluster overlap in vehicular ad hoc networks**", University of Technology of Troyes, has proposed a new dynamic mobility based and stability-based clustering scheme is introduced for urban city scenario. The performance of the scheme is compared with Lowest-ID and the most recent and the most cited clustering algorithm VMaSC and the results showed that the proposed scheme showed a better stability performance. The drawback is that, to investigate the impact of the number of hops on the cluster performance, since the algorithm is based on one-hop approach. [2] H.Su and X. Zhang, "**Clustering-based multichannel mac protocols for QoS provisionings over vehicular ad hoc networks**", Department of Electronics and Communication Engineering, Motilal Nehru National Institute of Technology has presented a clustering based cognitive MAC (CCMAC) protocol which allows dynamic allocation of channels. The novelty of CCMAC is that it eliminates the concept of primary and secondary user. The results demonstrate the effectiveness of the CCMAC protocol in allocating real-time and scalable spectral resources, fast and efficient reception of safety messages. The drawback is that the paper doesn't work towards queuing and scheduling of safety messages in case they fall short of accessing any of the DSRC channels. [3] N. Lu, N. Cheng, N. Zhang, X. Shen, and J. Mark, "**Connected vehicles: Solutions and challenges**", Department of Civil Engineering, Texas A&M University presents a framework that utilizes different models with technology-appropriate assumptions to simulate different vehicle types with distinct communication capabilities. The analysis reveals that connected and autonomous vehicles can improve stability. In addition to stability, substantial potential throughput increases under certain scenarios. The drawback is that models used in the paper could be potentially used to model regular, connected, and automated vehicles. The model selection in this paper was based on the current state-of- the-art in modeling these vehicles. Therefore, the results presented in this paper are not actual observations of the real world implementation.[4] K. Abboud and W. Zhuang, "**Impact of node clustering on routing overhead in wireless networks**", University of Technology of Troyes, has proposed Two-Hop Centralized Energy Efficient Clustering (THCEEC) and

Advanced heterogeneity-aware Centralized Energy Efficient Clustering (ACEEC) routing protocols which are derived from Centralized Energy Efficient Clustering (CEEC) routing protocol for three level heterogeneous WSNs to enhance the stability and network lifetime of WSN. The drawback is that they failed to develop implementations of the proposed protocols for real applications so that we can optimize them in real-life scenarios.

Research direction

The existing system uses single hop information forecasting between nodes using Markov.This kind of single hop based forecasting doesn't provide accurate value, sos we must a better process than Markov.This velocity, energy and position between the nodes greatly impact the communication amongst these nodes.Markov process is used for analyzing continuous events whereas Semi-Markov process is used for analyzing both discrete and continuous events. The centralized topology control scheme guarantees only one connected neighbor; the network connectivity can be broken even when only a single node is disconnected.

Discussion

In the existing Vehicular Ad-hoc network, stochastic modeling of single hop cluster stability. A cluster in a vehicular ad-hoc network suffers from velocity, position and energy of each node. The proposed system is used for multi hop information forecasting and stochastic modeling for synchronizing vehicular nodes for co-operation. The proposed system is used to model behavior of the vehicle in terms of energy and relative velocity using Semi-Markov based process. The proposed system increases processing time and avoids loss of data packets in the network during transmission.The drawbacks of the existing system can be overcome by applying Semi-Markov based prediction algorithm.

Conclusion

An ad-hoc network is a LAN through which individual network nodes forward packets to and from each other. The existing system consists of centralized topology control but hold various issues. Ad-Hoc network, receiver cooperation in topology control is used to improve energy efficiency as well as network connectivity. The proposed system presents an alternative based on the distributed cooperative topology control system.According to this an energy aware frequency reuse mechanism to improve the cooperative communication in the network. Distributed system in future can be combined with embedded systems which will result in development of real time applications.

References

[1] K. Abboud and W. Zhuang, "Impact of node mobility on single-hop cluster overlap in vehicular ad hoc networks," in Proc. ACM MSWiM, 2014, pp. 65–72.

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