A Grid based Secured on-Road Localization System with Liner Error Propagation using VANET AODV Protocol

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Abstract

GPS navigators has widely adopt by drivers. However, due to this sensibility of GPS signals to terrains, vehicles cannot to get their locations, when they are anyone inside a tunnel or a road it's surrounded by high rises, where satellite signal is ended. This mainly used for safety and convenience problems. But the VANETS advance into their critical areas and to become more dependent on these localization systems. GPS is starting to locate some uncertain problems, such not always being the available or not being robust enough for this some different applications. For the reason, a number of other localizations techniques such as Cellular Localization, Dead Reckoning, and Image Video Localization have been used in VANETs to overcome the GPS limitation. To address this issues, to proposes a novel Grid based On road localization system (GOT), where these vehicles with and without accurate of GPS signals self organizes into a Vehicular Ad Hoc Network (VANET), exchange the locations and distance information and helps to each other's to calculate an accurate position for all these vehicles inside the network. The location information's can be exchanged among vehicles one or multiple hops away in this paper.

Keywords- Network Simulator, VANET, MANET, Localization

I. INTRODUCTION

The research community has being interested as Vehicular Adhoc Networks (VANETs) for several years, since the deployments of the types of network will be able to provide significant improvement in terms of road safety, where the majority of protocols adopted flooding techniques to warn all the nodes, as well as the traffic authorities, about the accident.

The proposed solution is essentially based on techniques of clustering, where a cluster head is chosen among a group of vehicles and a techniques, for the establishment of the relative's position of the nearby node. Every clusters head establishing a local coordinate systems and calculate the position of its entire neighborhood in the group using the distances measured between vehicles. In the aim to reducing the calculate times in dangerous situations, the orientation of the coordinate systems of the first cluster head and the global systems are considered the same. This new solution provides to sufficient locations information and accuracy to supports basic network function. A real time video transmission has high requirement of term on bandwidth and delay, while VANETs is characterized by very limited radio resources and high mobility. Furthermore to ensure that good behavior under any type of circumstances, also study the impacts of GPS drift on their schemes [1].

However, due to the sensibility of GPS signal to trains, vehicles cannot be get their location, when they insides a tunnel or on a road surrounding by high rise where a satellites signal is blocked. To address these issues they proposed a novel grid based road localization systems. where vehicles with and without accurate GPS signals self-organize into a Vehicular Adhoc Networks (VANET), exchanging a locations and distance information's and help each other to calculating an accurate positions for all the vehicles inside the networks [2].

The majority of localization method network nodes have known their positions of these nodes act as a source for localization of the rest networks node. Vehicles equipped with Global Positioning Systems (GPS) receivers, are mostly used as beacon. However all the vehicles have not been equipped with their GPS? Also we give an overview of the existing method of localization and especially their using in VANET network [3]. The localization methods of a vehicle compares to an event when it's informed for their existences of accident or a looming dangerous. It a mission of their immense consequences that can be avoid impact of vehicles and loss of human life [4].

But many Adhoc networks, such as vehicular Adhoc networks in which vehicles can been consider as vehicles, due to highly mobile environments this change topology rapidly GPS information does not to work in a urban areas where the node density is low. Vehicles node moves a very fast in roads and highways, to be a safe and transport system, any vehicle should know about where a traffic problem due to broken vehicles or some other reasons where an accident has been taken place for provide safety in an intelligent transport system[5].

In these networks, vehicles communicates with each other and possibly with a roadside infrastructures to provide a long list of application varying from transits safety to driver support and internet access. In this network acquaintance of the concurrent

position of nodes is an assumption made by more protocol, algorithms, and applications. Here a very rational supposition, since GPS receivers can been installed their easily in the vehicles a number of VANET applications into three main group according to their localization requirements. [4].

To become an enable technology when attempting to provide instantaneous video transmission in vehicular networks; to present an applications that makes the use of traffic, focusing instead of evaluate the efficiency of different flooding schemes with the purpose of achieving a long distance real time video transmission under different circumstances, such as different vehicle densities and different degrees of GPS accuracy [6].

This establishment has been extensive, and more number of system equations have been explores to calculate locations through the help of location aware nodes that are two hop away, First of all, the signal reflection and interference problem is more serious when measuring signal attenuation, and thus the calculated distance is likely to be more inaccurate. Recently to further inside the tunnel to calculate the locations. Inside of this situation, errors are propagated by exponentially when they using this existing methods, resulting high inaccuracy [7].

II. VANET

Automatic vehicles information can be viewed on electronic maps using the Internet or specialized software. The advantages of WiFi based navigation systems function is that it can be effectively locates a vehicle, which is inside big campuses like airports, and tunnels, universities. In VANET network can be used as parts of automotive electronics applications, which has to be identify an optimal minimal path of navigation with minimal traffics intensity.

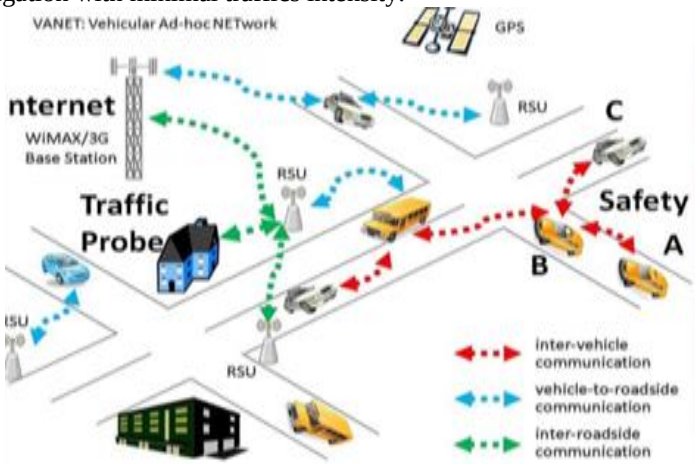

Fig. 1: VANET Network

A. Inter Vehicle Communication:

In the intelligent transportation system, vehicles need only a concerned with activity on the road ahead and not been behind. There are two different types of message forwarding in inter vehicle communications; navy broadcasting and intelligent broadcasting. In navy broadcasting, vehicles to send broadcasting messages periodically and its regular intervals. Upon receipts of the message, the vehicles ignore the message, if it has comes from a vehicle behind it. If the message has to come from a vehicle in frontally, the receiving vehicle sends its own broadcasting message to vehicles behind it. This ensures that all enables vehicle moving in the forward directions to get all screen messages.

Multiple Adhoc networks technology integrated with VANET such as, ZigBee, WiMAX IEEE, and Wi-Fi IEEE for convenient, effective simple and plain communications within automobiles on active mobility. Security measurement are defined as vehicles by VANET, flowing communications within the automobiles, edutainment and telemetric.

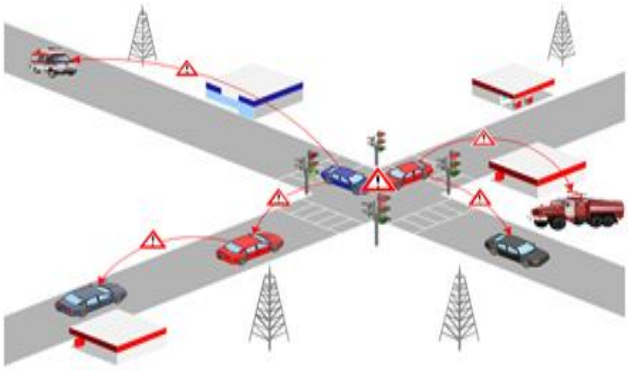

Fig. 2: Inter Vehicle Communication

Intelligent broadcasting with implicit acknowledgement addresses the problems are inherent in broadcasting by limiting the number of messages broadcasting for a given emergency event. If the event detecting vehicles receive the same message from behind, it assumes that at least one vehicle in the back has received it and cases broadcasting.

B. Vehicle Roadside Communication

Vehicle to roadside communication configurations provide a high bandwidth links between the vehicles and roadsides unit. The roadside units may be placed at every kilometer or less, enabling high data rates to be maintained at heavy traffic. For instances, when the broadcasting dynamic speed limits, the roadside units will determines the appropriate speed limits according to its internal timetable and traffic conditions.

The roadside unit will periodically broadcast a message containing the speed limit and will compare any geographic or directional limits with vehicle data to determine if a speed limit caution applies to any of the vehicles in the locality. If vehicles violate the desired speed limits of broadcasting data will be deliver to the vehicle in the form of an auditory or visual warning, requesting that the driver reduce his speed.

III. VEHICLE MONITORING

VANET, Most of us all the vehicles have GPS for finding the locations of the vehicle. It is mainly helps to finding the vehicles easily, the GPS handset reports wrong information's, when they are in crowded metropolitan area, such as Manhattan, where there are build many tall buildings. The GPS receivers also lose satellite connections in some places such as tunnels or multi floor bridges, resulting in safety and convenience problem.

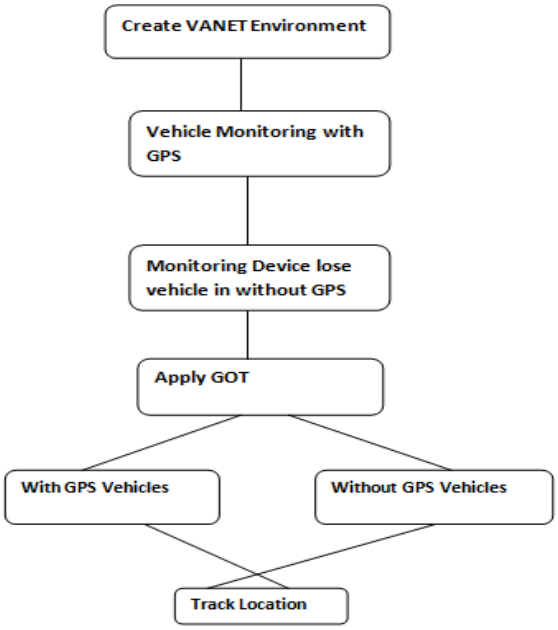

Fig. 3: Vehicle Monitoring Block Diagram

A. GOT

Grid Based on road Localization System (GOT) , where vehicles with or without accurate GPS signal self-organize into vehicular Adhoc Network (VANET) , exchange the locations and distance information and help each other's to calculate an accurate positions for all the vehicles inside the networks. A vehicle obtains the location and distance information's in its neighborhood through communication. The information will be discarded if its distance to the corresponding node is larger than our communication threshold. If a vehicle only knows the location of its neighbors and distances to them, it must know at least three location-aware neighbors to enable the location calculation.

B. AODV Protocol

In AODV networks is a silent connection is needed. At the points of network nodes that requires needs of connection broadcasting a request for connections. Other AODV nodes forward this message and record the node that they hearing it form, creating an explosion of temporary route back to the needy nodes. When node receiving such a message and already has been routes to their desired node its sends a message backward through a temporary routes to the requesting node. The needy nodes then begin using their routes that has the least number of hops through other nodes. Unused entries in the routing tables are recycled after a time.

IV. SIMULATION RESULT

A. Create Network Topology

event	time	from node	to node	pkt type	pkt size	flags	fid	src addr	dst addr	seq num	pkt id

```
r : receive (at to_node)                    src_addr : node.port (3.0)
+ : enqueue (at queue)                      dst_addr : node.port (0.0)
- : dequeue (at queue)
d : drop    (at queue)


        r 1.3556 3 2 ack 40 ------- 1 3.0 0.0 15 201
        + 1.3556 2 0 ack 40 ------- 1 3.0 0.0 15 201
        - 1.3556 2 0 ack 40 ------- 1 3.0 0.0 15 201
        r 1.35576 0 2 tcp 1000 ------- 1 0.0 3.0 29 199
        + 1.35576 2 3 tcp 1000 ------- 1 0.0 3.0 29 199
        d 1.35576 2 3 tcp 1000 ------- 1 0.0 3.0 29 199
        + 1.356 1 2 cbr 1000 ------- 2 1.0 3.1 157 207
        - 1.356 1 2 cbr 1000 ------- 2 1.0 3.1 157 207
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Fig. 4: Turn on Tracing

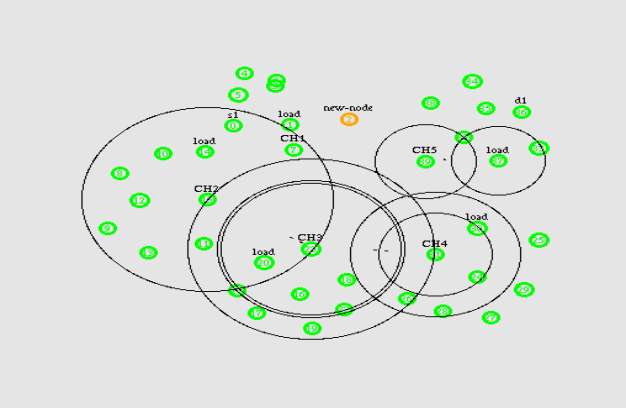

Fig. 5: NAM Output

The above diagram Fig 5 shows that NAM output, it is a network animator which describes that to shows the output on animation. For the animation the node has created and to move the nodes of a single node to another node.

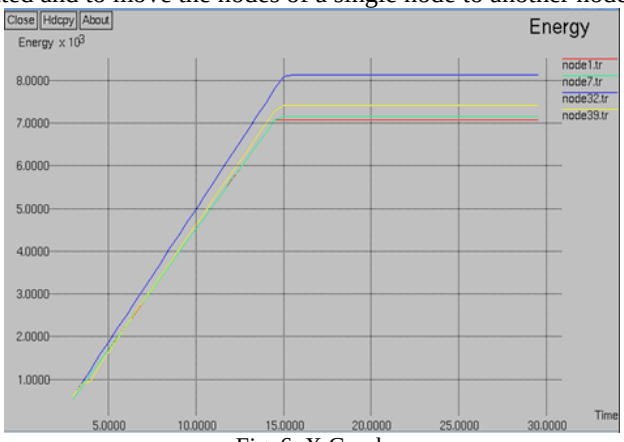

Fig. 6: X Graph

B. Testing and Debugging

The testing and debugging phase of a project can easily take more time than it took to write the application. Testing includes both checking that the code runs at all, that it runs correctly under all circumstances, and that it runs the same way it did before you made changes. Tcl's error diagnostics make it easy to track down coding errors; the modular nature of Tcl code makes it easy to do unit testing of functions, and the tcl test package makes it easy to write integrated regression test suites.

C. Debugging Code

The first step to debugging a Tcl script is to examine the Tcl error output closely. Tcl provides verbose error information that leads you to the exact line where a coding error occurs. Tcl error messages consist of a set of lines. The first line will describe the immediate cause of the error

V. CONCLUSION

This paper proposes GOT, a grid-based on-road vehicle localization system. For study the different geometric relationships among their vehicles and design a grid-based mechanism to calculate the vehicle location. Some other solutions for localization, such as cellular, dead reckoning, video/image processing, distributed ad hoc and cooperative localization were discussed. All of these approaches have their own advantages and disadvantages. We also discussed data fusion techniques for position information. This survey will help researchers develop new efficient approaches to address localization issues in VANETs.

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