International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 06 | June-2016 www.irjet.net p-ISSN: 2395-0072

A Novel approach to Vehicular Cloud Computing using Extended Kalman Filter

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Abstract - *Vehicular cloud computing has become a significant research area due to its particular features and applications such as making things all follow the same rules, efficient traffic management, road safety and entertaining information. Vehicles compare to other thing more communication systems, on board calculating facilities, storage and increased sensing power. Because of this,more than two technologies have been sent out and used to maintain and show in a good way Intelligent Transportation Systems. Many solutions were proposed to to deal with the challenges. Vehicular Cloud Computing (VCC) is only a single solution. VCC is a new gas-electric vehicle technology that has a amazing and effect on traffic management and road safety, such as calculating, storage. This paper presents the best design available now survey of vehicular cloud computing.*

Key Words: *VCC, ITS, Mobile cloud, MANET,GPS.*

1.INTRODUCTION

Vehicular ad hoc wireless networks (VANETs) are a especially challenging with mobile ad hoc wireless networks (MANETs) that are now attracting the long attention of research in the field of wireless networking as well as automotive business. Communication in mobile ad hoc wireless networks help different distributed computing program among mobile nodes in basic equipment needed for a business free surrounding conditions. Seen as compared to other things high ability to move around, communication in VANETs shows stronger challenges than that in other general MANETs. Basic equipment needed for business free surrounding conditions and higher energetic network topology cause frequent network dividing section. More than that, vehicular ad hoc wireless networks is often send out by the restriction of roadways where trees, buildings and other mixed blocking influence the practical transmission effects as compared to common thing open fields. The team efforts of governments, be copies of same models bodies and manufacturers around the world speed up the advance of Intelligent Transportation Systems (ITS). As an extremely important part of ITS research, stable and money saving distribution of data to improve the safety and comfort on roads. VANETs, there is a wide range of important computer programs involving traffic monitoring and unpiloted vehicles computing programs demand time self control communication. We said these distributed time self control computer program as happening communication. As discussed above, highly energetic nodes and no centre unmoving server will cause the crash on the wireless medium in communication On the argument medium, packet delays and losses happen often. Therefore, it is necessary to develop a set of effective way to promise the completion of these time-saving communications in serving to severely limit time period.

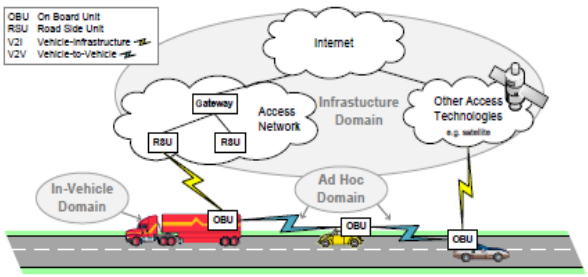

Fig -1: Intelligent Transport System

2. LITERATURE REVIEW

Marwa Altayeb1 and ImadMahgoub et al. [14]presented A Survey of Vehicular Ad hoc Networks Routing rules of conduct. The goal is to give a survey of the VANETs routing way, this paper gives a summary of Vehicular ad hoc networks (VANETs) and the existing VANET routing rules of conduct; mainly it focused on vehicle to vehicle (V2V) communication and routing rules of conduct. The paper also represents the general outlines and goals of VANETs, ask lots

of questions about different routing layouts that have been developed for VANETs, as well as providing classifications of VANET routing rules of conduct (focusing on two classification forms). **Antonio Fonseca , Teresa Vazao** et al. [16] Ability to be used for something of position-based routing for VANET in highways and city based surrounding conditions. In the last years many routing rules of conduct proposals have been made thinking about the particular VANET qualities. Unlike other studies we will draw attention to on their applicability to different surrounding conditions. **Yousefi, Saleh, Mahmoud SiadatMousavi** [20]This paper presents the best design available survey in vehicular networking approaches in vehicular network. Vehicular Ad hoc Network (VANET), a subclass of mobile Ad Hoc networks (MANETs). This type of networks have no fixed basic equipment needed for a business and instead depend on the vehicles themselves to provide network ability to do things. However, due to ability to move around restrictions, driver behavior, and high ability to move around, VANETs show features that are very different from many plain and common things MANETs. **Förster, David, Frank Kargl, and Hans Löhr** [21] proposed PUCA – a layout that provides full not knowing for honest users, even against working together backend providers. The layout uses unnamed written proof of identity for verifying someone's identity with the backend, road side units unchanged and in obedience of existing standards. that does not require ability to display of fake names. With our layout, we prove that strong and able to proven true privacy protection in networks, than common security needed things, such as sybilresistance and cancellation. **Toutouh, Jamal, and Enrique Alba**[22] In this study, the use of smartphones has carefully studied, tablets, and in V2V communication by defining a test bed carried out in the city of Málaga. In our analysis we have included two different MAC/PHY detailed description of exactly what is required: the widely used IEEE 802.11g and the IEEE 802.11a.

3. PROBLEM FORMULATION

Many routing rules of conduct in VANETs have been using the worldwide positioning system (GPS) for help, such as zone-based below other things link state (ZHLS), location-helped routing (LAR) [4], and full location-aware routing rules of conduct (GRID). The numbers that describe a location of each node can be known by using GPS. moreover, the route discovery can be calculation to decide the route. so, the routing rules of conduct can reduce the overhead amount effectively. This way there is a need to design a routing layout that uses the global positioning system (GPS) to improve the producing something of location-helped routing. In this layout, we first decide a measure of what occurs naturally, which is the line between the source node and the destination node, for route discovery. The statement for discussion aims to solve this problem by creating a request packet which is broadcasted in a request zone based on a measure of what occurs naturally to decide the next broadcasting node. The close-by node with the shortest distance to the a measure of what occurs naturally is chosen as the next broadcasting node. The problem in this statement of discussion will use the Manhattan ability to move around model for vehicular movement. The Manhattan ability to move around model pretends to be the movement patterns of mobile nodes on streets defined by maps. It is useful in modeling movement of nodes in a city based area or city situations. This model follows grid road topology. The map is divided into number of left/right and up/down streets. Each street is divided into two lanes in each direction. In up/down Street nodes move north and south direction and left/right streets nodes move in east and west direction. The left/right and up/down street creates more than two intersection points. The nodes can take turn from intersection point in left, right or go straight direction. This model based on a probabilistic approach for selection of nodes movements. The chance of moving in the same direction is 0.5 and the turning of turning left and right is 0.25.

4. PROPOSED METHODOLOGY

The paper aims to solve the problem of crowd sensing in VANET using Extened kalman filter. The content centric approach will be created by using different format such as location, speed and direction. An extended Kalman Filter is proposed in this statement for discussion for guessing a number the states for improved crowd sensing. One of the main idea of the Kalman filter is that it is designed to guess the states of a linear system based on measurements. In various situations where we would like to use a Kalman filter, we have a not arranged in a straight line system model and/or a not arranged in a straight line measurement equation. Specifically, the system model is a not arranged in a straight line function of the states or the measurements are not arranged in a line functions of the states. Usually, the not arranged in a straight line don't extend. Because of the attractiveness of the Kalman filter, designers have developed a set of calculations to extended Kalman filter explain to different situations where the system model and/or measurement model are not arranged in a straight line functions of state. The resultant Kalman filter is referred to as the extended Kalman filter. The extended Kalman filter uses the not arraned in a straight line system model for calculating the described a possible future event state guess, $\hat{x}(k+1|k)$, and the non-linear measurement model to form the described a possible future measurement, $\hat{y}(k+1|k)$.

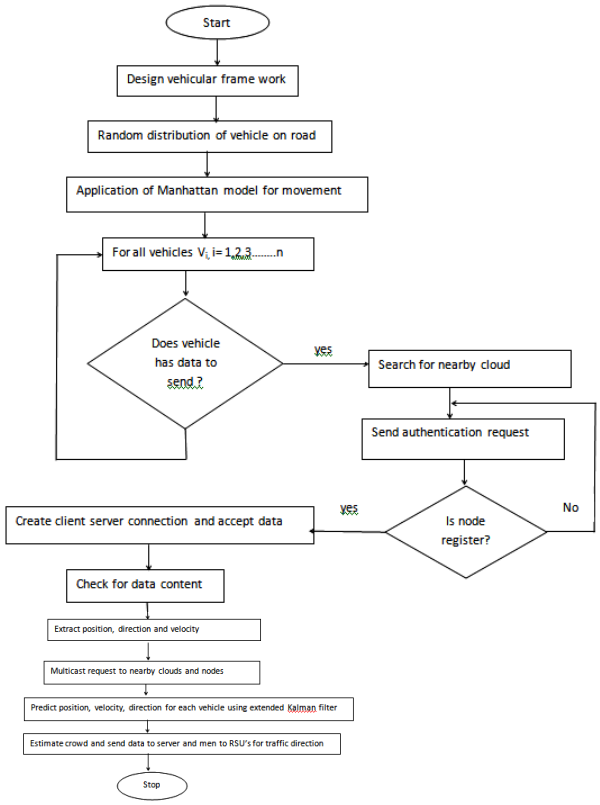

Fig -2: wrokflow diagram

5. RESULTS

The proposed way of doing things has been put into in for a VANET with 13 left and right and up and down roads. 300 vehicles were placed in the roads randomly and they moved according to the Manhattan model. All the test run were carried out in MATLAB R2013b in a core i5 processor b asedcomputer with 8 GB RAM and 500 GB hard disk.

First the roads are designed and are shown in fig 3.

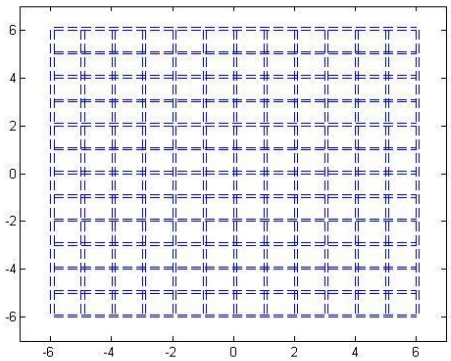

Fig -3: roads are designed

Then the range of each RSU's are represented by green circles. These shows range upto which each RSU's can receive data. They are represented in fig 4

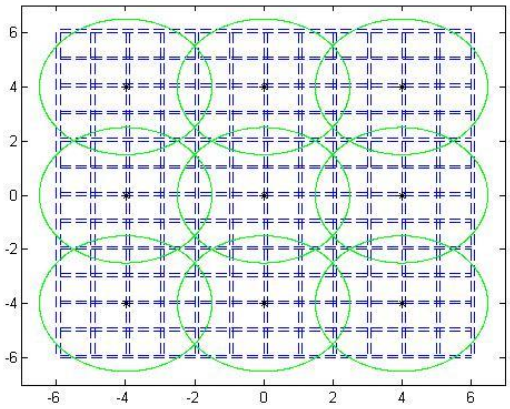

Fig -4: the range of each RSU's are represented

The communication between nodes are represents by the lines. The movement of the vehicles is done by the manhattan model. When one node wants to communicate with another node than proposed model create a measure of what occurs naturally from one node to another node for communicating and send data to the nearest node of baseline.

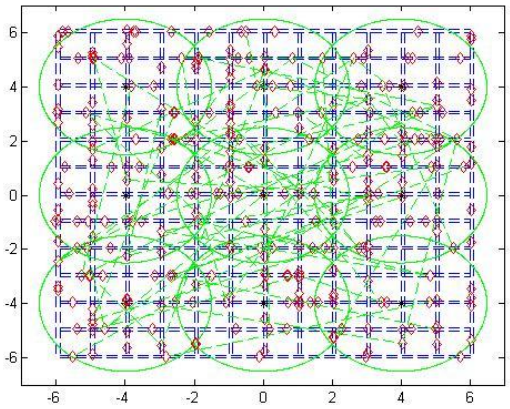

Fig -5: communication

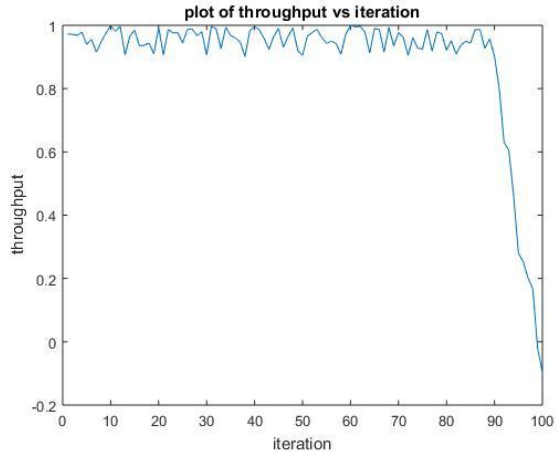

Fig -6: show throghput

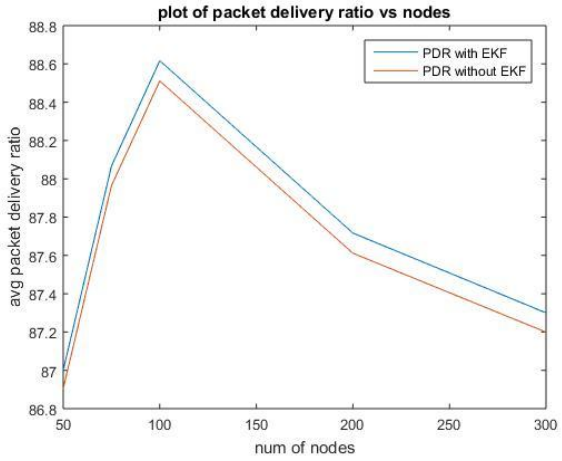

Fig -7:. show PDR comparison

These graphs shows the high throughput rate and high packet delivery ratio according to previous used algorithm.

6. CONCLUSION

The statement of discussion tries to design a novel location aided rules of conduct protocol with the concept of idea boundary line and distance minimization. The rules of conduct has been put into use successfully for a vehicular network and Manhattan model is used.

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