INTERNATIONAL JOURNAL OF RESEARCH
In Advanced Engineering Technologies

Volume 6, Issue 3 FEB 2018

ROADSIDE INFRASTRUCTURE FOR VEHICULAR NETWORKS BY USING NON-INTRUSIVE PLANNING

B.MOUNICA[1] , G.LAKSHMAREDDY[2]

M Tech student, Associate Professor [2]

Dept Of ECE, Newton's Institute of Engineering, Macherla , Alugurajupally (V),Macherla (Mn), Guntur, A.P, India.

Abstract: In this article, we describe a strategy for planning the roadside infrastructure for vehicular networks based on the global behavior of drivers. Instead of relying on the trajectories of all vehicles, our proposal relies on the migration ratios of vehicles between urban regions in order to infer the better locations for deploying the roadside units. By relying on the global behavior of drivers, our strategy does not incur in privacy concerns. Given a set of available roadside units, our goal is to select those α-better locations for placing the roadside units in order to maximize the number of distinct vehicles experiencing at least one V2I contact opportunity. Our results demonstrate that full knowledge of the vehicle trajectories are not mandatory for achieving a close-to optimal deployment performance when we intend to maximize the number of distinct vehicles experiencing V2I contact opportunities.

KEYWORDS: *Roadside infrastructure, Vehicles.*

INTRODUCTION

Intelligent Transportation Systems are grounded onvehicular networks [1], i.e., sophisticated communicationnetworks receiving data from several entities composing thetraffic system. In a vehicular network, the communication mayhappen in an ad hoc basis where vehicles exchange messageswithout any support infrastructure [2].However, the ad hoc communication may become inefficientin sparse areas such as highways, rural zones, and low peakhours in the city due to the lack of communicating pairs andradio obstacles. The intense mobility of vehicles also makesrouting far complicated as we lack reliable means to infer thefuture location of vehicles. Although the communication maytake place in an ad hoc basis, several works [3], [4] demonstratethat a minimum support infrastructure may largely improve theoverall efficiency of the network.The deployment of infrastructure for vehicular networks hasgained a lot of attention over the past years. Some researchershave devoted their attention in elaborating analytical formulations.The work [8] proposes the definition of an infrastructurefor vehicular networks based on the conventional definition oftransport capacity. The authors develop a mathematical modelwhere the destination nodes are chosen at random by thesource nodes, and they study the effect of the infrastructurenode deployment in the capacity of vehicular networks usinganalytical expressions.Alpha Coverage [9] provides worst-case guarantees on theinterconnection gap while using fewer roadside units. A deploymentof roadside units is considered α-covered if anysimple path of length α on the road network meets at leastone roadside unit. The authors compare the α-coverage witha random deployment of roadside units.

PROPOSED SYSTEM

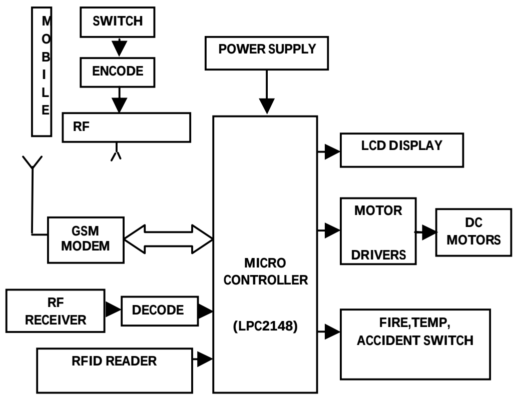

Fig: Block Diagram

METHODOLOGY

RFID:

Radio Frequency Identification (RFID) is a silicon chip-based transponder that communicates via radio waves. Radio Frequency Identification is a technology which uses tags as a component in an integrated supply chain solution set that will evolve over the next several years. RFID tags contain a chip which holds an electronic product code (EPC) number that points to additional data detailing the contents of the package. Readers identify the EPC numbers at a distance, without line-of-sight scanning or involving physical contact. Middleware can perform initial filtering on data from the readers. Applications are evolving to comply with shipping products to automatically processing transactions based on RFID technologyRFID Reader Module, are also called as interrogators. They convert radio waves returned from the RFID tag into a form that can be passed on to Controllers, which can make use of it. RFID tags and readers have to be tuned to the same frequency in order to Communicate. RFID systems use many different frequencies, but the most common and widely used & supported by our Reader is 125 KHz.

Fig: RFID Reader

Tags are classified into two types based on operating power supply fed to it.

1. Active Tags
2. Passive Tags

Active Tags: These tags have integrated batteries for powering the chip. Active Tags are powered by batteries and either have to be recharged, have their batteries replaced or be disposed of when the batteries fail.

Passive Tags: Passive tags are the tags that do not have batteries and have indefinite life expectancies.

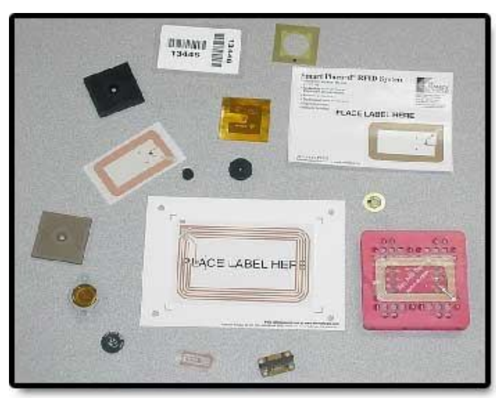

Fig: Different types of tags

GSM:

Global System for Mobile Communication (GSM) is a set of ETSI standards specifying the infrastructure for a digital cellular service.

The network is structured into a number of discrete sections:

- Base Station Subsystem – the base stations and their controllers explained
- Network and Switching Subsystem – the part of the network most similar to a fixed network, sometimes just called the "core network"
- GPRS Core Network – the optional part which allows packet-based Internet connections
- Operations support system (OSS) – network maintenance

SM was intended to be a secure wireless system. It has considered the user authentication using a pre-shared key and challenge-response, and over-the-air encryption. However, GSM is vulnerable to different class of attacks, each of them aiming a different part of the network.

DC Motor:

A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the center of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°.

Fig: DC Motor

Motor driver:

DC motors are typically controlled by using a transistor configuration called an "H-bridge". This consists of a minimum of four mechanical or solid-state switches, such as two NPN and two PNP transistors. One NPN and one PNP transistor are activated at a time. Both NPN and PNP transistors can be activated to cause a short across the motor terminals, which can be useful for slowing down the motor from the back EMF it creates.

High Side Left	**High Side Right**	**Low Side Left**	**Low Side Right**	**Quadrant Description**
On	Off	Off	On	Forward Running
Off	On	On	Off	Backward Running
On	On	Off	Off	Braking
Off	Off	On	On	Braking

Table: operation of H-Bridge

H-bridge. Sometimes called a "full bridge" the H-bridge is so named because it has four switching elements at the "corners" of the H and the motor forms the cross bar. The switches are turned on in pairs, either high left and lower right, or lower left and high right, but never both switches on the same "side" of the bridge. If both switches on one side of a bridge are turned on it creates a short circuit between the battery plus and battery minus terminals. If the bridge is sufficiently powerful it will absorb that load and your batteries will simply drain quickly. Usuallyhowever the switches in question melt.

RF transmitter and Receiver:

RF transmitters are electronic devices that create continuously varying electric current, encode sine waves, and broadcast radio waves. RF transmitters use oscillators to create sine waves, the simplest and smoothest form of continuously varying waves, which contain information such as audio and video. Modulators encode these sign wives and antennas broadcast them as radio signals. There are several ways to encode or modulate this information, including amplitude modulation (AM) and frequency modulation (FM). The ST-TX01-ASK is an ASK Hybrid transmitter module. The ST-TX01-ASK is designed by the Saw Resonator, with an effective low cost, small size, and simple-to-use for designing.

- Frequency Range: 315 / 433.92 MHZ.
- Supply Voltage: 3~12V.
- Output Power: 4~16dBm
- Circuit Shape: Saw

RF receivers are electronic devices that separate radio signals from one another and convert specific signals into audio, video, or data formats. RF receivers use an antenna to receive transmitted radio signals and a tuner to separate a specific signal from all of the other signals that the antenna receives. Detectors or demodulators then extract information that was encoded before transmission. There are several ways to decode or modulate this information, including amplitude modulation (AM) and frequency modulation (FM).

The RX04 is a low power ASK receiver IC which is fully compatible with the MitelKESRX01 IC and is suitable for use in a variety of low power radio applications including remote keyless entry. The RX04 is based on a single-Conversion, super-heterodyne receiver architecture and incorporates an entire phase-locked loop (PLL) for precise local oscillator generation.

CONCLUSION

In this work we propose a deployment algorithm based on migration ratios between urban cells without relying on the individual vehicles trajectories. We have so many advantages by implementing this project, it gives complete solution for traffic and transport related problems such as accident alert, tollgate control, parking management and special zone alert system. It is proposed as a low cost optimized solution using RFID and GSM modem.

REFERENCES

[1] H. Hartenstein and K. Laberteaux, “A tutorial survey on vehicular ad hocnetworks,” IEEECommun.Mag., vol. 46, no. 6, pp. 164–171, Jun. 2008.

[2] J. Blum, A. Eskandarian, and L. Hoffman, “Challenges of intervehiclead hoc networks,” IEEE Trans. Intell. Transp. Syst., vol. 5, no. 4, pp. 347–351, Dec. 2004.

[3] A. Reis, S. Sargento, and O. Tonguz, “On the performance of sparse vehicularnetworks with road side units,” in Proc. IEEE 73rd VTC—Spring,May 2011, pp. 1–5.

[4] K.Mershad, H. Artail, and M. Gerla, "Roamer: Roadside units as messagerouters inVANETs,"AdHocNetw., vol. 10, no. 3, pp. 479–496,May2012.
[5] R. H. Frenkiel, B. Badrinath, J. Borres, and R. D. Yates, "The infestations challenge: Balancing cost and ubiquity in delivering wireless data," IEEEPers. Commun., vol. 7, no. 2, pp. 66–71, Apr. 2000.
[6] O. Trullols, M. Fiore, C. Casetti, C. Chiasserini, and J.B. Ordinas, "Planningroadside infrastructure for information dissemination in intelligenttransportation systems," Comput. Commun., vol. 33, no. 4, pp. 432–442,Mar. 2010.
[7] C. M. Silva, A. L. Aquino, and W. Meira, Jr., "Deployment of roadsideunits based on partial mobility information," Comput. Commun., vol. 60,pp. 28–39, Apr. 2015.
[8] M. Nekoui, A. Eslami, and H. Pishro-Nik, "The capacity of vehicularad hoc networks with infrastructure," in Proc. IEEE 6th Int. Symp.
WiOPT, Apr. 2008, pp. 267–272.
[9] Z. Zheng, P. Sinha, and S. Kumar, "Alpha coverage: Bounding the interconnectiongap for vehicular internet access," in Proc. IEEE INFOCOM,Apr. 2009, pp. 2831–2835.

AUTHORS DETAILS

Student Details :

Name :B.Mounica

Email Id:bssvasavi @gmail.com

Ms.B.Mounica was born in Macherla,AP on August 27, 1993 . She graduated from the Vignan Nirula Engineering College, Guntur . She special fields of interest included Embedded systems & VLSI. Presently She is studying M.Tech in Newton's Institute of Engineering, Macherla.

Faculty Details:

Name: G.Lakshma Reddy

Email id : glakshma143@gmail.com

Mr. G.Lakshma Reddy was born Guntur,AP, on February 11, 1985. He graduated from the Jawaharlal Nehru Technological University,Hyderabad; His employment experience included PrakasamEngineeirngCollege,Kandukur, the Nalanda Institute of Engineering and technology, and Institute for Electronic Governance,Hyderabad. His special fields of interest included VLSI & Embedded Systems, Digital Signal Processing & communication Systems. Presently He is working as a Assoc Prof in Newton's Institute of Engineering, Macherla. So far he is having 10 Years of Teaching Experience in various reputed engineering colleges.