

CONGESTION CONTROL AND COLLISION AVOIDANCE IN VEHICULAR AREA NETWORK

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Abstract: Nowadays accidents are huge drawback in urban areas which results in damage of property and loss of life. Throughout, the accident is generally a collision which is caused by the motive force of the subsequent automotive cannot acknowledge the mishap and take a right call among many moments. hold up on the opposite hand may be a Brobdingnagian bother that conjointly takes place simply once the accident. The vehicles within accident space got full, moreover while not have the information of the accident, vehicles from opposite direction create knotty. It affects the busy life of humans. So, by viewing these issues we propose in this paper An method which help to avoid the series of collision and for the management holdup exploitation transport Ad-Hoc network (VANETs), by using a network in which the automotive is recognized as mobile node and every automotive is indicated as wireless node or router. We valuated the performance of the routing protocol on basis of parameters for the knowledge rates exploitation network machine two. The outputs of the experiment are analyzed to know the acceptable routing and raincoat protocol for our method in transport space networks.

mobile network is not required for the VANETs as it as the capability to form its own network. In this network, the communications are carried between various nodes like vehicle to infrastructure (V2I) and vehicle to vehicle (V2V) i.e. road facet unit (RSU). To establish the communication infrastructure, Road Facet Unit (RSU) in every intersection of road and each vehicle is given a aboard Unit OBU.

II. OBJECTIVE

This aims to scale back or utterly eliminate the necessity of traffic signals at junctions in each heavily inhabited cities and smaller cities as they're typically mismanaged and don't adapt to the assorted traffic conditions mechanically. If it's manually controlled, it's not secure that the controller is dominant it within the best approach. this method can alter traffic management at junctions supported the situation, speed and acceleration of the approaching vehicles with a potency that can't be matched by manual management.

III. METHODOLOGY

In this phase, we propose an algorithm which is used to avoid the accidents and prevents the congestion in VANETs. In our proposed method, transmission of the emergency message will be faster which is very helpful VANETs to avoid collision and to control traffic congestion. Scenario for the proposed method is shown in fig. and is explained as follows: consider that , one Road side unit (RSU) is at every intersection of the road and are connected by wire which helps for faster communication. If link fails then there will be wireless RSU to RSU communication and RSU to vehicle communication will be wireless always. In vehicle to vehicle communication, every vehicle will have onboard unit (OBU) attached to it which as capability to send and receive message. Every OBU can communication with its nearest OBU and RSU. RSU have the capability to send message to the several OBUs within its covering range. There are two parts of process: communication process which helps to avoid accident and the process for congestion control.

Index Terms:- VANET's, Traffic, MAC protocol.

I. INTRODUCTION

Currently, the number if vehicles are increased on roads boundlessly. So, accidents on road and holdup is at the disadvantage. Therefore, by analyzing the up road safety application as the subject of vast concentration. Safety application avoid the accidents when the activities of human are in wireless network. Through this field, transport Ad-Hoc networks (VANETs) play various roles. Two styles of networks are offered by the wireless network which are Mobile Ad-Hoc networks (MANETs) and VANETs [1]. Ad-Hoc networks will communicate among in exact range of area. Then this network can conjointly connect to the large areas by using basic mobile station and web. Bunch of moving vehicles expansively capable of human activity which every exploitation VANETs. The flexibility is increased to the spacious region by basic web facility and mobile service. Therefore, the VANETs referred as special sort of MANETs or in other words it is a set of MANETs. Base station or switch in

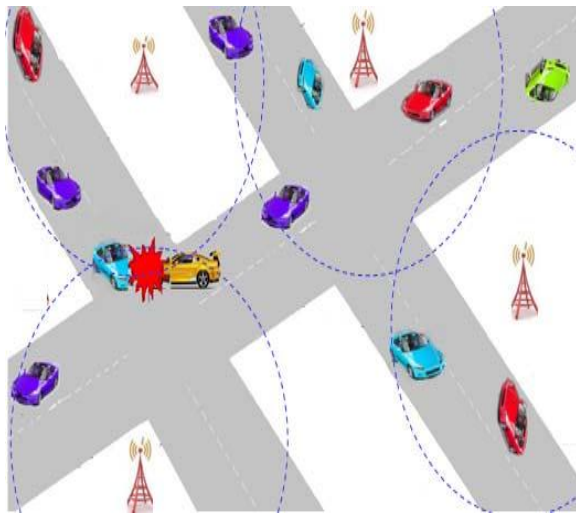


Fig 3.1: Methodology

IV. BLOCK DIAGRAM

HUB SECTION

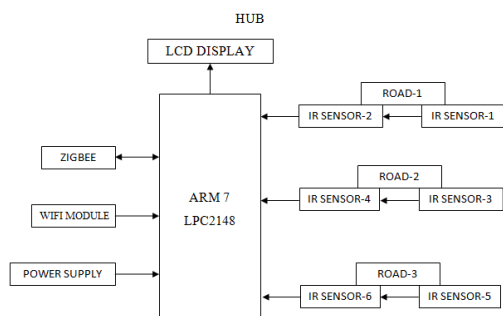


Fig 4.1: Block Diagram Hub section

Hub section mainly contains ARM 2148, LCD, IR Sensors ZIGBEE.

Each IR Sensor Placed at a particular distance which is already fixed.

When a vehicle detected at first infrared sensors timer turns on in program.

When vehicle detected at second sensor timer will be turned off.

Time taken or timer value will be used for speed calculation.

ZIGBEE Module is used for communication to vehicles.

Wifi module is used to inform about traffic in hub to other places Wifi module is required.

Hub has multiple functions so parallel computing is required.

VECHILE SECTION

Vehicle 1:

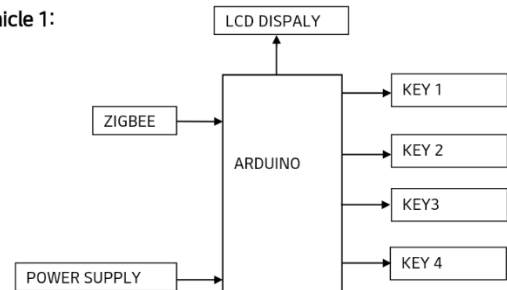


Fig 4.2: Block Diagram of Vehicle 1

Vehicle 2:

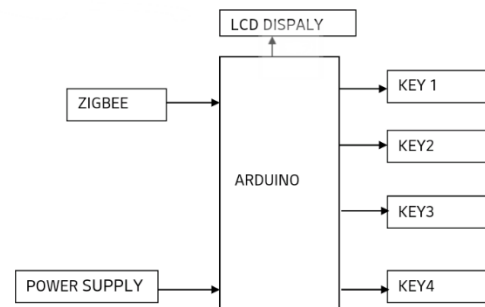


Fig 4.3: Block Diagram of Vehicle 2

Vehicle section contains ZIGBEE module, ARDUINO controller, display.

ARDUINO is used to receive data from ZIGBEE and display on LCD.

The data received from hub about vehicle movement, crossing the junction or not will be updated on LCD. Depending on the values received the movement will be decide.

V. HARDWARE AND SOFTWARE COMPONENTS

HARDWARE REQUIREMENTS:

POWER SUPPLY An influence provide may be an hardware which provides the power to an device. The power received through an electric outlet converts the alternating current (AC) into direct current (DC), this is of the pc use.

PSU A which as a peak rating of 550 watts at 25°C, and 25 amps (300 W) on the 12 v.

PSU B have continuous rating of 450 W at 40°C, with 33 amps (400 W) on 12 V.

IR TRANSMITTER AND IR RECEIVER

This sensing element are often used for many indoor applications wherever no necessary close lightweight is gift. For simplicity, this sensing element does not give close lightweight immunity, however a a lot of sophisticated,

close lightweight ignoring sensing element ought to be mentioned in an exceedingly coming back article.

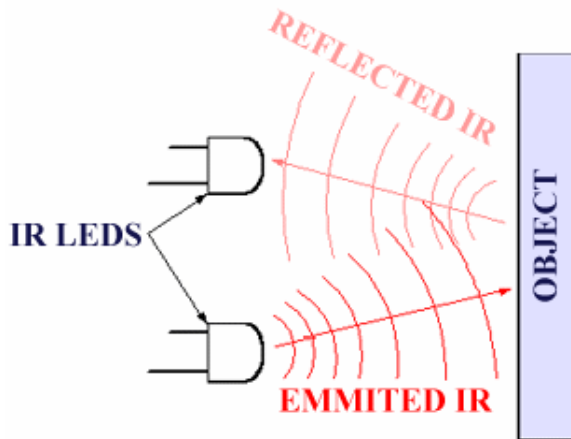


Fig 5.1: IR Transmmission

The performance of the detector is increased by correct positioning of the receiver semiconductor diode, the sender light-emitting diode with relation to one another and to the op-amp. The regulation of the position of the sender junction rectifier with reference to the receiver semiconductor diode is needed.

LIQUID CRYSTAL DISPLAY:

The use of the LCD is to see the digital output of the appliance. 16X2 LCD is used in the project which indicates a pairs of rows and 16 columns. Therefore we can write the 16 character in every line. Thus total 32 characters can be shown. The visualization output of the various modules can be viewed which are interfaced with the microcontroller. Thus the significance of the digital display exceeds the project to envision the output and to rectify the system failure. The module is made up of LSI controller which as 2 eight bit registers, information register (DR) and an instruction register (IR).

ARM LPC2148

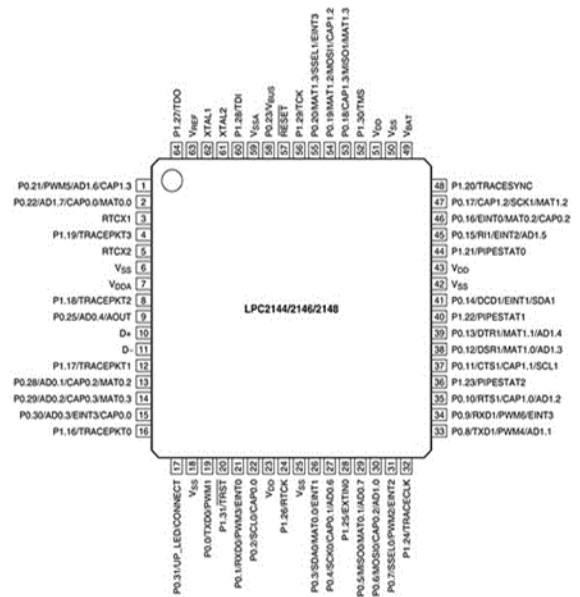


Fig 5.2: Pin Diagram of ARM

ARM7 processor is often utilized in embedded system applications. Also, it's a balance among classic further as new-Cortex sequence. This processor is tremendous find the resources existing on the net with excellence documentation offered by NXP Semiconductors. The LPC2148 microcontroller is meant by Philips (NXP Semiconductor) with many in-built options & peripherals. Because of these reasons, it'll create a lot of reliable further because the economical possibility for associate degree application developer. LPC2148 may be a 16-bit or 32-bit microcontroller for analysis in formation within the analysis of format document.

GSM SIM 300

GSM modem is a dedicated type which accepts the SIM card, and the operation over the subscription to mobile operator, like mobile phone.

The connection between GSM modem and computer allows the computer to communicate over mobile network by using GSM modem. These are mostly used for mobile internet connectivity and also to send and receive SMS and MMS messages.

Features of sim 300 module:

- Triband gsm/gprs 900/1800 mhz
- Plug-in module for interface with microcontrollers.
- Gprs multi-slot class 10
- Compliant to gsm phase 2/2+
- Class 4 [2w @ 900 mhz]

- Class 1 [1w @ 1800/1900mhz]

- Control via at commands [gsm 07.07, 07.05 and simcom enhanced at command]

SOFTWARE REQUIREMENTS:

Embedded ICE:

Standard ARM Embedded ICE logic affords on-chip right support. A number laptop running the programme software system Associate in Nursing is used by debugging of target, an Embedded ICE protocol converter. It converts the remote right protocol commands to the JTAG information which is required to control the ARM core which as the DCC operation inbuilt.

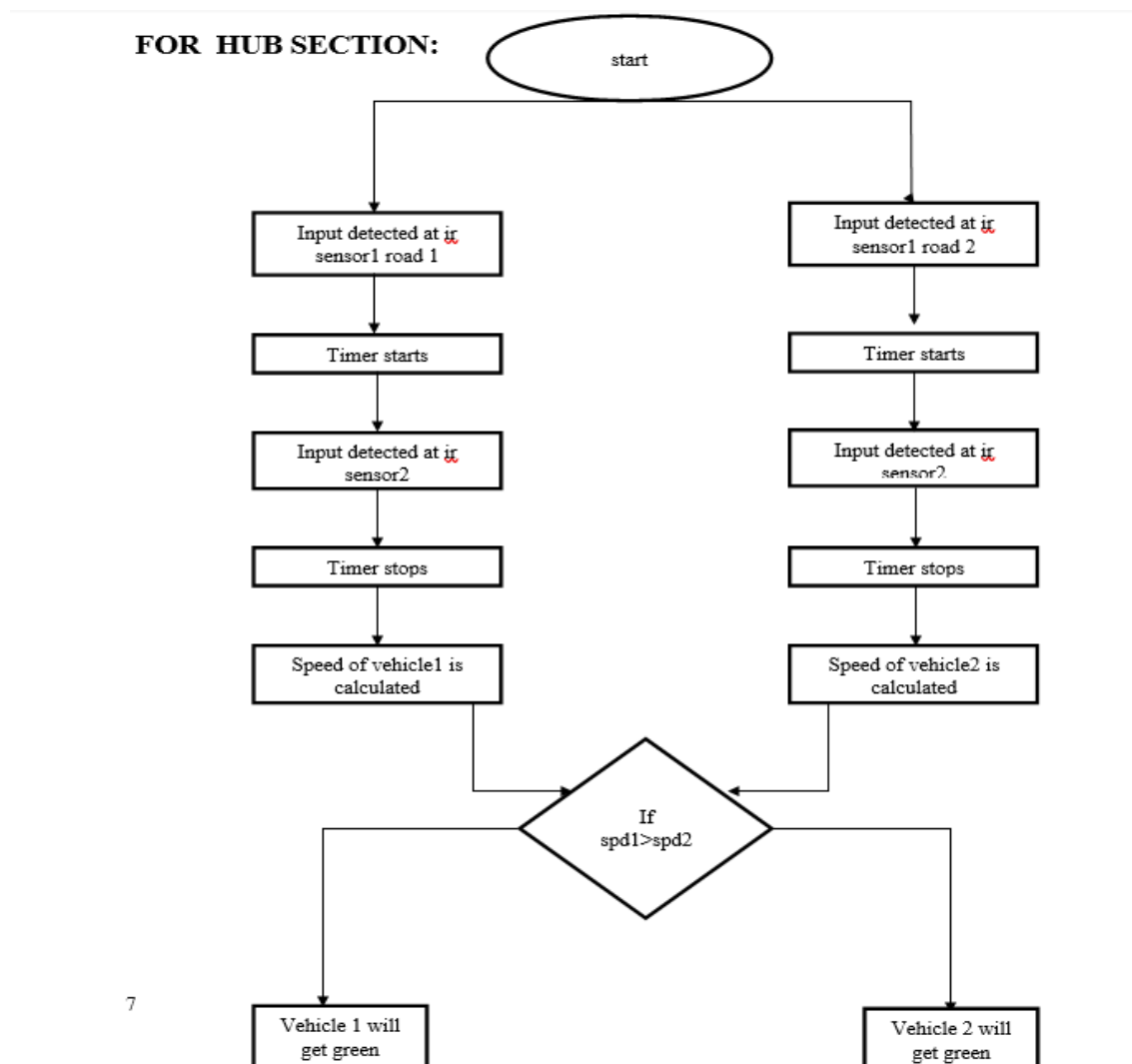
Kiel M vision

KEIL offers a comprehensive varieties of advanced tools like ANSI compiler, debuggers, micro assemblers, linkers, library manager, IDE, analysis boards and period operative system.

ARDUINO IDE

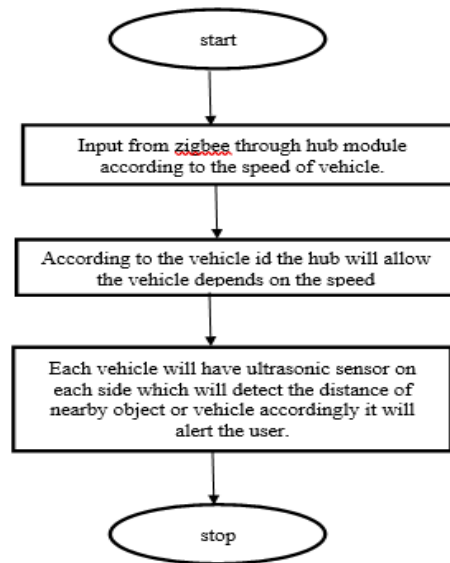
The ARDUINO integrated development environment (IDE) stays as a cross-platform application (for Windows, MACOS, Linux) which is written within the proگرامing language Java. the situation familiarized to write and transfer programs to ARDUINO boards, and with the assistance of 3rd party cores and also different vendor boards.

VI. FLOWCHART



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FOR VEHICLE SECTION:



The operation of the module is represented in flow chart.

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VII. ADVANTAGES AND APPLICATION

Advantages

- Improving Traffic Management
- Providing Driver Assistance
- Providing Direction and Route Optimization
- Improving safety of the road.
- To reduce congestions in the traffic.
- It guides the streamlining of the flow of vehicles on road.

Applications

- This network provides the varied range of applications with variety of characteristics.
- It can be used in ghat area.
- In highways to avoid accidents.
- In cities where junctions are present.
- Additionally, some of the applications need technologies which are not available now. Eventually, the full handling control of our cars to the vehicles themselves, like autopilot.

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