KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru -560012

PROJECT PROPOSAL

Name of College and Place: KLE Dr. M S Sheshgiri College of Engineering and Technology, Belagavi.

Project title: Car to Car Communication.

Department: Telecommunication.

Name of project guide: Prof. Sagar Metri
Telecommunication dept.
KLE Dr. MSSCET, Belagavi.
Email id: Sagarmetri04@gmail.com
Mobile no.: +91 9738481991.

Name of the team members:

1. Adarsh Anil Kale (Team Leader) Email id: Adarsh.kale@gmail.com
   Mob no.: +91 9738077462
2. Govind D. Kakatkar. Email id: Gotyakakatkar3@gmail.com
3. Shweta R. Siddannavar Email id: Shwtsiddannavar@gmail.com
4. Sampada Gaonkar. Email id: Sampada.gavkar@gmail.com

Objective of the Project:

The main motivation for vehicular communication systems is safety and eliminating the excessive traffic collisions. According to World Health Organizations (WHO), road accidents annually cause approximately 1.2 million deaths worldwide; one fourth of all deaths caused by injury. If preventive measures are not taken, road death is likely to become the third-leading cause of death by 2020.A new era is arriving where vehicles will communicate with each other, the devices within them, and also with the world; making the next generation of vehicles into communication hubs.

C2C / V2V (short for vehicle to vehicle) is an automobile technology designed to allow automobiles to "talk" to each other. By this, the vehicles can get the information (about the events) from other vehicles moving around them. This will help the vehicle to communicate with others even in the blind spot, Rainy/Foggy environments. The line of sight is not required for this type of communication. The technology implemented here is the RF communication. The RF Transceivers will transmit and receive the radio frequency informative radiations in terms of data packets (air as a medium).

Methodology:

Identifiers of events:

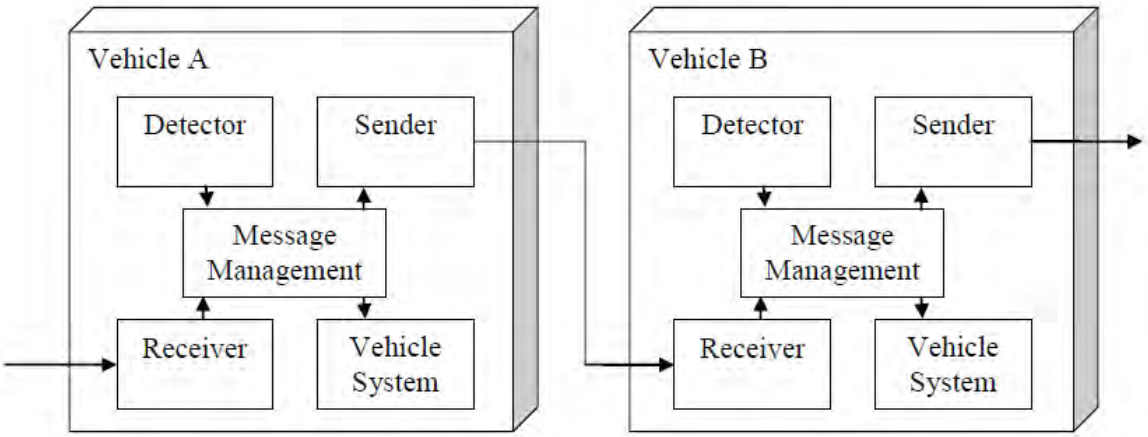
1. Emergency Vehicle approaching

2. Traffic Jam Ahead Warning
3. Warnings on Road works
4. Warnings on parking lights

Requirements:

1. Radio Frequency Transmitter and receiver (Transceiver).
2. Microcontroller (8051 architecture).
3. IR sensors.
4. Display Unit.
5. Cars (small) for demonstration.

Block diagram:



Detector: It senses the events happening in its surrounding environment. The events can be Traffic Jam, Road work warnings, Emergency vehicle approaching etc. It detects and sends the information to the message management block.

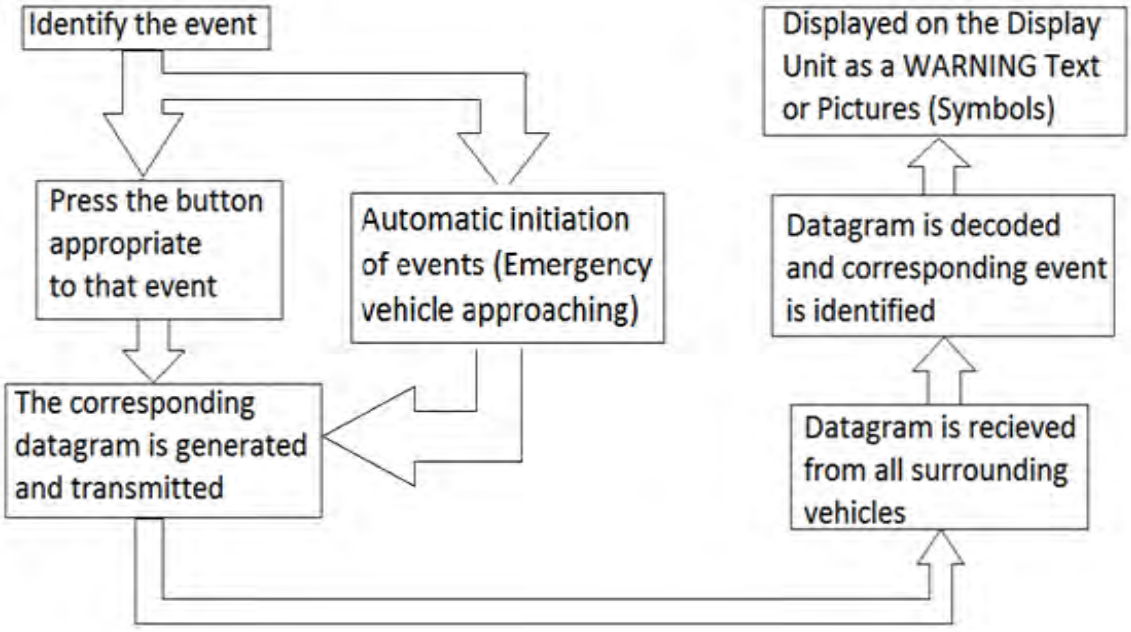
Message Management block: It consists of a microcontroller which encodes the event into a data packet and sends it to the sender block. It also receives the datagrams from the receiver block and decodes it to a suitable corresponding message and sends it to the Vehicle system.

Sender: It consists of a wireless communicating protocol in our case a RF transmitter. It gets the data to be sent from the message management block and transmits the datagram in the frequency band of 433MHz. Since it is a universal transmitter, all the RF receivers surrounding the vehicle in its range (100m) will receive the appropriate datagram.

Receiver: It consists of a wireless communicating protocol in our case a RF Receiver. It receives the datagram in the frequency band of 433MHz. Since it is a universal receiver for RF ranging 433MHz, the datagrams sent by the transmitter which come in its range will be received and sends the same to the message management block.

Vehicle System: It's the display unit of every car which is usually the infotainment system, in our case a LCD display. This displays the warning messages given from the message management system.

Flowchart:



The detector identifies the event happened. This can be done by pressing the manual button in the case of event 'parking on road' and the other events such as Emergency vehicle approaching, traffic jam ahead warning and Road work warnings are automatically identified.

According to each event the corresponding datagram is generated and encoded using H12E encoder and it is transmitted using RF transmitter which transmits the data in the range of 433MHz frequency.

The RF receiver receives the datagram sent by the transmitter and the same is decoded by the H12D decoder which converts the radio waves into binary combinations. Based upon the information sent from transmitter corresponding event is identified. The identification of the event is done by the microcontroller where the datagrams for particular event is stored and compared with the incoming datagram and a appropriate event is identified.

After identifying the event a LCD display system is used to display the warning messages of that corresponding event. As all RF receivers are universal, the message is received by the entire RF receivers which lie in the range of 100m and which are working in the frequency range of 433MHz.

Expected outcome: Proper communication between the cars using RF module.