Vehicle Monitoring System

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Abstract— "IoT" is currently the most popular aspect of the research field. They consist of an extremely large amount of data to be researched. The data it holds is secured with privacy protocols. "The Vehicle Monitoring System" for vehicles helps in maintaining vehicle and also protect from accidents due to engine overheating as well as tire bursting. It uses wireless communication mode for communicating with the cell phone of the device user. This paper presents the review of the tire pressure monitoring, engine overheat monitoring, accident detection system and CO2 exhaust detection system. This system is helpful for maintaining vehicles and to protect vehicles from accidents and to detect the accident if it happens. The communication of the system with the authorized cell phone will be done with the help of the GSM module which is present inside the device.

Keywords— monitoring, microcontroller, detection, bursting.

I.   LITERATURE REVIEW

While doing literature survey of such a system, we find several system and technology which are in use for detecting tire pressure as well as accidents but they are not much more efficient and accurate also they are not affordable to everyone and one of the major problem of such systems is their implementation. In now a day's people need more features with less cost in single system so these previous systems are not capable of fulfilling the users wish. Following are some survey paper name which implements some particular task separately in them. 'Wireless tire pressure monitoring system for a vehicle using wireless communication' in this paper they were detecting automatic pressure and temperature of two tires in real-time in this research paper we examine the wireless communication-based tire pressure monitoring system with respective information will be based on wireless communication and how to make more efficient and perfect. We have to detect the pressure and temperature will automatically detect in real-time, but don't detect in running condition.

II.   INTRODUCTION

Vehicle Monitoring System is a system that is designed for vehicle with engines like air cooled as well as liquid cooled type. This system helps to monitor the bike's engine status and also the tire air pressure of the tire and detects level of carbon monoxide releasing from the vehicle.

In everyday life,road accidentsare become more common. Most of the accident occurs due to the bad condition of engine or due to the bad condition of vehicle tires. Our system will help the vehicle owner to easily monitor the condition of the vehicle. This device is a combination of different functional devices. This will monitor tire condition, engine overheating, carbon monoxide exhaust level and accident detection. The device will be connected to a cell phone over a wireless network and if a device detects any problem then it will send message to the vehicle owner also will give a buzzer so that the driver will get alert of problem and it will also show the detected problem in the display of that device so that the driver can exactly get that what is the problem.

III.   ARCHITECTURE OF INTERNET OF THINGS

Basically there are three layers in the architecture of the Internet of Things. These three layers communicate with each other internally. The layers are Perceptual layer, Network layer and Application layer.

Perceptual layer -It is the lower most layer of IOT it is mainly used for identifying objects and collecting information. It is connected to the hardware device like a GPS, sensor, RFID tags, and sensor web and connected to any intelligent system, it also called physical layer as the information from the physical devices use only analog signal has been converted into a digital signal that is suited for web transmission.

Network layer - It is a second layer of the IOT architecture. Its primary use is to obtain data or information from the physical layer. It is a network management centre for IOT. It gains data or information from the perception layer that has been processed and removed to the different networks via wired or wireless network

Application layer – It is the topmost layer of every IoT device. It takes input from the network layer and works upon the input data. It provides a graphical user interface to the device user for easy access of the IoT device and allows the user to change the default settings of that device through that application.
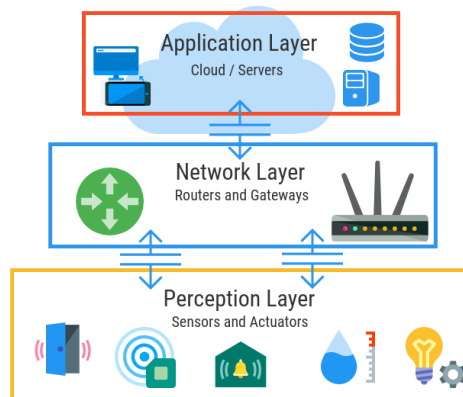

Figure 1. Layers of IoT

IV. WORKING OF DEVICE

The working of the device will be in four different components that components are tire pressure monitor, engine overheat monitor, carbon monoxide level monitor and last will be accident monitor. All these four subsystems will give real time input to the microcontroller and according to inputs of these all the microcontroller will give alert to the driver or user in critical condition.

Tire pressure monitoring –A tire pressure sensor will be fixed on the nozzle of the tire and will be connected to the device wirelessly so that it can give inputs to it in real time. Road tires normally require 80 to 130 psi so below and above this the tire may get damage, so the minimum and maximum values for good tire pressure will be provided to that sensor via coding now if the tire pressure goes below that values or goes above that values in that case the sensor will give the input to the microcontroller and as the microcontroller gets unexpected input it will communicate to the respective cell phone and send message to it like "TIRE PRESSURE BELOW/ABOVE RANGE" and will also show same message on display unit of the device and will blow buzzer so that the driver can get alert.

Engine overheat monitoring - A LM35 temperature sensor will be fixed below engine and will be connected to the device with wires so that it can give inputs to it in real time. Bike temperature ranges from 68c to 104c, so the minimum and maximum values for normal engine temperature will be provided to that sensor via coding now if the engine temperature goes below that values or goes above that values in that case the sensor will give the input to the microcontroller and as the microcontroller gets unexpected input it will communicate to the respective cell phone and send message to it like "ENGINE TEMPERATURE BELOW/ABOVE RANGE" and will also show same message on display unit of the device and will blow buzzer so that the driver can get alert.

The working of the carbon monoxide level monitoring and the accident detection sub system will be same like workings of engine overheat monitoring and tire pressure monitoring but the difference will be in hardware used for that subsystems. For carbon monoxide level monitoring CO2 sensor will be used and for accident detection system the impact sensor will be used so that they can generate correct and desired outputs.
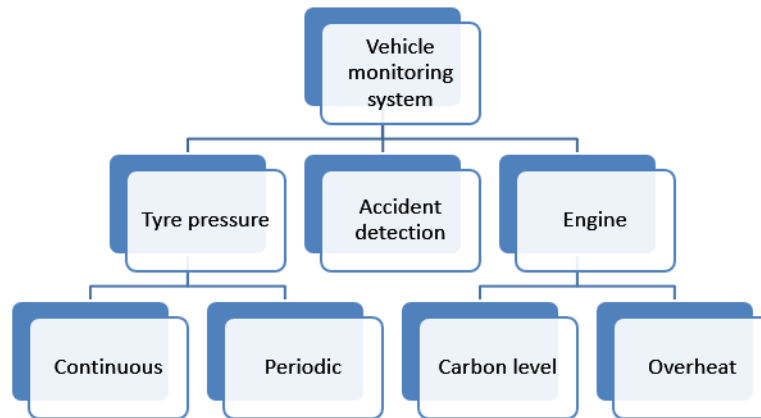
Figure 2. Components of Vehicle monitoring system

V. CONCLUSION AND FUTURE SCOPE

This system provides an efficient technique to maintain the vehicles it not only monitors the device but also keep the vehicle safe from the tire bursting problem and avoid accidents due to tire bursting and due to engine overheating. This system communicates with the cell phone when any critical condition occurs. It is useful for all kind of vehicles and provide more features with efficient working and easy accessibility of the device. It is less costly as comparable to other vehicle monitoring system so that anyone can afford it. Motive of designing such a vehicle monitoring system is to protect vehicle, owner and also to protect environment by controlling the pollution level. In future it can be possible to implement live vehicle tracking system on the same device so that the owner can get information and live location of his vehicle every time when he requires it.

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