

# Embedded System in Passenger Car with Medical Safety and Alert System

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## Abstract:

Embedded systems have a huge variety of applications that varies from low to high-cost consumer electronics to industrial equipment's. An Embedded system with Internet of things (IOT) is a world-wide network connecting all the smart objects together. One of the way in which a things are enabled to communicate with each other by using IOT. With continuously increasing urban population and rapidly expanding cities, vehicle ownership has been increasing at an exponential rate. Road accidents are one of the world's major public health and injury prevention problems. According to the World Health Organization (WHO), more than a million children are killed in road accidents each year, all over the world. Then motivation behind this paper is an attempt to make an Arduino based embedded system which makes the passenger's journey even safer and more secure. This paper handles the road discipline such as speed control in different areas and horn control in horn prohibited zones. The features included in this paper are Vehicle Speed Control in school Zone and also controlling the speed of the vehicle in different zones such as bridges, highways, cities and suburbs. It also includes Horn Control of Vehicle in No Horning Zone- Control horn disturbances in horn prohibited zones such as hospitals, public libraries, courts, schools and Alcohol detection to detect drunken driving.

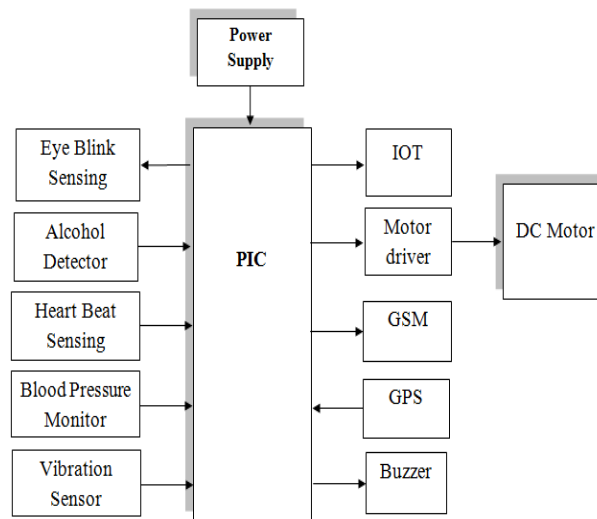
**Keywords:** Internet of Things(IOT), Arduino, Alcohol sensor, eye blink sensor, BP sensor, Vibration sensor

## 1. INTRODUCTION

An advanced embedded system with IOT in automobiles has increased rapidly in the recent years. Every year automobile manufacturers introduced embedded systems into their cars for different functionalities like ignition, security and audio systems. The technological development of an embedded system within the vehicle are being ambitiously challenged to make the vehicle energy efficient, network savvy and safer. A project-based laboratory for learning embedded system design with support from industry is presented and the aim is to learn the building blocks of embedded systems and practical control algorithms by constructing a line-following robot using the quadratic interpolation technique to predict the line position [1]. Through a combination of embedded system with an Internet technology, the existing and traditional monitoring technologies has digital video technology .The sensor is directly connected and the monitoring equipment to achieve remote management and real-time data transmission, realize the resources and information sharing and increase the efficiency and reliability[2]. To optimize the module design and allow for plug and play of sub-module, automotive electronic system architecture evaluation and development must be supported with a robust module design flow based on virtual

platforms[3]. The timed automata can be used to model and to analyze timeliness properties of embedded system architectures. Using a case study inspired by industrial practice presented in detail for suitable timed automata model is composed [4]. An IoT promises the (inter-) connection of myriad of things providing services to humans and machines. A new kind of architecture is needed as a scalable and trusted platform underpinning the expansion of IoT[5].

## 2. BLOCK DIAGRAM



**Figure.1.**Block diagram of embedded system based alert car.

In the Existing system, there is no device to monitor for the environment and there is alert to driver only for caregivers monitoring. The draw backs of the existing system is no wireless system for data transfer and no alert to driver. The proposed system while monitoring there is any abnormal condition is happened the system will send an alert and easily monitor via wireless (wireless communication)and also monitor horn control for environment and Alcohol detection control. The proposed system monitoring for driver alcohol detection, if the driver consumed alcohol then the detector will send the information to the engine and the buzzer. Then the engine will not start and also it will produce sound by using buzzer and controlled by PIC microcontroller Nowaday's many accidents occur due to drowsiness which will create major problem during night driving. Another monitoring system is Eye Blink sensor, the main use of this sensor is monitoring the eye motion of the driver and send information whether the driver is feeling any drowsiness or not. The research say that 60% of person got heart attack while driving in order to overcome this problem using heart beat sensor. While driving the vehicle if the blood pressure of the person increases then it can be checked by using the blood pressure sensor. If the heartbeat, blood pressure increases than the normal valve then the sensor send the signal to PIC controller. Then the controller sends the information to hospital along with the location by using GPS and GSM through IOT.

Finally an Accident Alert system was added by using Vibration sensor if the sensor got a hit, it considered as an accident and then it automatically detect the location through GPS then sent through GSM and also uploaded by using IOT. Here IOT played a major role and collect the information from the heart beat sensor, blood pressure sensor, eye blink sensor, alcohol detector, vibration sensor when it got abnormal condition and then uploaded to the specified cloud location.

In the proposed system, the sensors are playing a key role and it measures the physical quantity and converts it to an electrical signal which can be read by an observer or by any electronic instrument like an analog to digital A2D converter. An A2D converter converts the analog signal sent by the sensor into a digital signal. Processor PIC micro controller process the data to measure the output and store it to the memory. A digital-to-analog D2A converter converts the digital data fed by the processor to analog data. An actuator compares the output given by the D-A Converter to the actual (expected) output stored in it and stores the approved output. GSM is a cellular phone which means that cell phones are connected to it by searching for cells in the immediate vicinity. The IOT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into monitoring station and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. The hardware snapshot is shown in figure.2. The advantages of the proposed system is Fast response, Auto alert system, No need of caregivers, Low cost, Easy to use to all mine's.



**Figure.2** Hardware snapshot for an embedded system based alert car

## CONCLUSION

The proposed embedded system based car having Speed Control in school Zone and also controlling the speed of the vehicle in different zones such as bridges, highways, cities and suburbs. It controls Horn Control of Vehicle in No Horning Zone- Control horn disturbances in horn prohibited zones and Alcohol detection to detect drunken driving and immediately sent the signal to control room with the help of IOT. The main focus of the article is to avoid an accident by means of human error.

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