I-Detector: An Intelligent Real Time Monitoring Vehicle System for Taxis

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Abstract—This project " I-Detector : An intelligent real time monitoring vehicle system for taxis" is a real time monitoring smart vehicle unit. Now-a-days vehicles have integrated system sensors which monitor real time critical information which are expensive. Moreover, the rate of accidents has increased drastically over the past few years. Therefore this system would assist the user and notify critical information of real time situations to inform police or owner himself. The system is integrated with GPS and Bluetooth Connectivity to provide real time tracking using SMS, real time monitoring sensors. The main components of the system consist of number of real time sensors like Touch sensor, alcohol consumption detector sensor, Accident sensors ,Exhaust Gas sensor and a software interface with GPS and Google Maps APIs for location used to monitor parameters and running report is generated every second on your android phone which is connected to the central database server. This system would improve the existing system and make it cost-effective and efficient.

Keywords: Real time monitoring, Sensors, GPS, Bluetooth.

I. INTRODUCTION

Information and communication technologies (ICT) provide new intelligent solutions that contribute to solving the key societal challenges posed by road transport. "Intelligent" systems can help drivers to avoid accidents, and can even call the emergency services automatically in event of a crash. They can also be used in reducing pollution. Despite their potential, most intelligent systems are not yet on the market, and when they are large-scale deployment has taken a very long period of time due to severe problems. Safety innovations tend to start from the top end of the market, in luxury cars, and take a long time to 'trickle down' to the mass market. There are many reasons for this slow process such as extremely competitive situation of the automotive sector, the relatively high cost of intelligent systems and the consequent lack of customer demand all contribute. Most of all, there is a lack of information throughout society about the use and potential benefits of these intelligent vehicle systems which would also benefit for taxis. Therefore the system which is cost efficient and compatible to all car/taxi, not only for luxury car who would   have a high market potential. As taxi services is a booming industry, this project develops a system which has continuous real time monitoring along with various sensors for monitoring vehicle/taxi ,thus helping to make the taxis more safer and improving the existing technology for taxis transportation.

II. PROPOSED SYSTEM

The system has various sensors namely Touch, Accident, Alcohol, Seat belt and Exhaust gas .Among these sensors, exhaust gas and alcohol sensors are still not used in cars. Now-a-days PUC checks are a must for all the vehicles .Using exhaust sensor we will have an inbuilt PUC system which will indicate system's maintenance status .Safety of the commuters is the most important aspect for any vehicle system. We come across various drink and drive cases which cause fatal accidents .Government has strict laws against drink and drive, yet there is no strict control over this. This system incorporates an alcohol sensor in cars to avoid drink and drive. Exhaust gas parameters would allow the driver or the taxi owner to schedule timely service maintenance of the taxi. Bluetooth connectivity of various sensors and Android Phone would reduce the cost of wiring and thus use the technology in vehicular units. This system has may applications such as constant GPS tracking, safety of passengers ,driver ,car and taxi owner assistance.

III. SYSTEM ARCHITECTURE

The figure below is the architecture of the "I-Detector : An intelligent vehicle monitoring system".
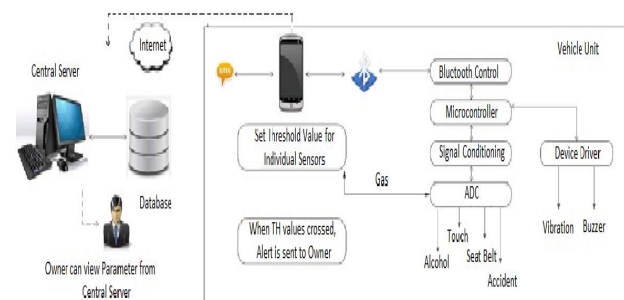
This system is an intelligent vehicle monitoring system which consists of a real time monitoring smart vehicle unit. The system is integrated with GPS and Bluetooth Connectivity to provide real time tracking using SMS, real time monitoring sensors. The main components of the system consist of number of real time sensors like:

1) Touch sensor
Touch sensor is a connected with steering wheel. If the user is not holding the steering the sensor will ring an alarm until the driver holds the steering at least with one hand.

The constraint here is driver should at least hold the steering with his one hand.

2) Alcohol consumption detector

The user will have to blow his mouth in the Alcohol Consumption detector every time he wants to start the car. The constraint here is the car won't start until he is detected properly. If the driver is found drunk immediately the administrator is instructed with a message.

3) Seat belt

The car will notify the driver to wear the seat belt. This is a Push-up button. Alert message is sent to taxi administrator when the taxi driver does not wear the seat-belt.

4) Accident sensors

These sensors detect if any other car collides with its car. These sensors are placed in the front and back of the bumper .which would inform the administrator through wireless signals.

5)Exhaust gas

Exhaust gas sensor will tell the user about the amount of different gases being emitted from the taxi.If car has been exceeding the minimum threshold values for releasing the gases then immediate servicing is needed ,if not then user can continue with the regular use.

SMS Alert:

If any of the above sensors cross the threshold value an alarm is raised in the car . In case of alcohol sensor and accident sensor, if driver is found drunk an alert is sent to the admin and in case of accident the nearest Police station Hospital and admin are informed immediately with the help of GPS location sent via SMS Alert.

IV. SYSTEM CONFIGURATION

The Proposed system will be designed using processor with an structured database like MySQL.

A. Hardware specifications

1)Admin side
- Processor: Intel I5
- RAM: 512 MB
- Hard disk: 30 GB

2)Client side
- Microcontroller: AVR (Advanced Virtual RISC) series: AT MEGA 32 (40 pin)IC with ADC 0808IC inbuilt.
- Bluetooth: HC-05
- Device driver: ULN 2803 (18 pin) IC
- Serial communication: MAX232
- Android Phone
- Sensors:
  - Alcohol sensor:MQ3 series
  - Accident sensor: IR sensor, vibration sensor
  - Touch sensor: Capacitive sensor plate
  - Seat belt: push-button up
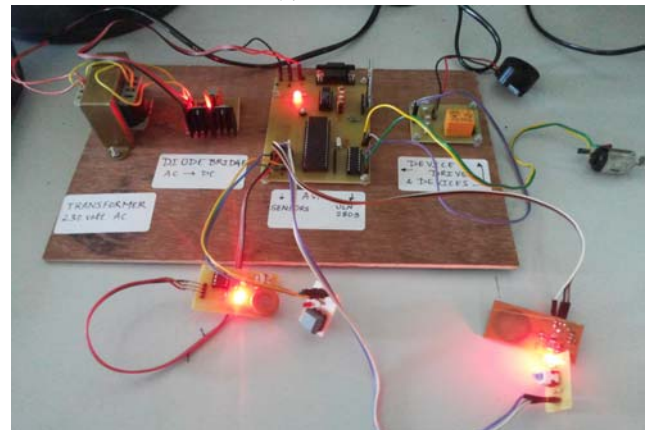 - Gas sensor:MQ6series

B. Software Specifications

1) Admin side
- Operating System: Windows7/8
- Speed: 1.7GHZ, 2gb RAM or more
- Server: Glassfish
- Frontend:
  - Jdk 1.6 and later
  - Netbeans 7.1 and later
- Database: MySql

2) Client side
- Operating system: Android
- Toolkit: Eclipse ADT

V. RESULT

VI. CONCLUSION

We propose an intelligent car system for accident prevention and making taxis or cabs a much better and safe option to travel. It would help the taxi owners by providing services listed in the proposed system. It has great market potential as well as large deployment feasibility due to low cost. Global acceptance for taxi services such as Ola, Uber and Meru. This system can be used by private car owners as well. Additional parameters can also be added.

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