IOSR Journal of Computer Science (IOSR-JCE)
e-ISSN: 2278-0661, p-ISSN: 2278-8727
PP 39-42
www.iosrjournals.org

Design & Implementation of Vehicle Black Box For Driver Assistance And Alert

Rajashri R. Lokhande[1], Sachin P. Gawate[2]
[1] *(WCC, Priyadarshini College of Engineering,Nagpur/ R.T.M.N.U, India)*
[2]*(Computer Technology, Priyadarshini College of Engineering,Nagpur/ R.T.M.N.U, India)*

ABSTRACT : *In this paper we proposed the GPS (Global Positioning System)/ GSM (Global System for Mobile Communication) for driver assistance and car surveillance. Wireless black box using MEMS accelerometer and GPS tracking system is developed for monitor the accident. The system consists of cooperative components GPS device and GSM module. In the event of accident ,if any injury happened to the car driver or passengers so maybe there will be loss of lives due to delay in medical help. Keeping this idea in our mind, we are proposing a system where car itself intimates the concern emergency service for immediate reaction in case of accident or any emergency situation. After the accident, this wireless device will send mobile phone short massage indicating the position of vehicle by GPS system to family members, nearest police station and hospitals. The emergency medical service (EMS) is provided to the driver. The threshold algorithm is used to determine speed of motorcycle and fall or accident in real-time.*

Keywords -MEMS accelerometer, GPS device, GSM module, emergency medical service (EMS), real time monitoring

I. INTRODUCTION

The car black box is a vehicle-based recorder which records video images, sound, GPS position, speed, and time. These data can be used for accurate car accident investigation and some public crimes prevention. However, there are important issues such as user privacy and a data management for a vehicle-based CCTV records. The proposed system can reduce driver privacy concerns and communication and management overheads. Our contribution is that we propose a feasible and useful scenario for public safety.

Car black box is a device to record driving history which can be used for car forensics in case of car accident or related crimes. Car black box stores video clips that could be critical clues for investigating car-related accidents or crimes. Wireless black box using MEMS accelerometer and Global Positioning System (GPS) tracking system is developed for accidental monitoring. The system consists of conjuctive components of an accelerometer, microcontroller unit, GPS device and GSM module[1]. In the event of accident, this wireless device will send mobile phone short massage indicating the position of vehicle by GPS system to family member, emergency medical service (EMS) and nearest hospital[1].

Consider the situation when there is an accident, there is no automatic service available for assisting a driver. If any injury happened to the vehicle owner or passengers so maybe there will be loss of lives due to delay in medical help. So for this purpose ,we propose a system where car itself intimates the concern emergency service for immediate reaction in case of accident or any emergency situation.

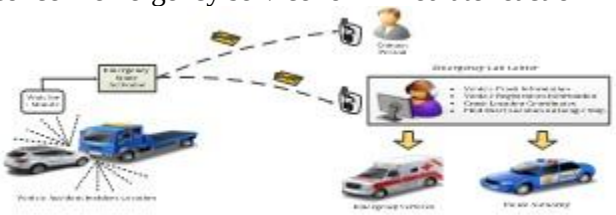

Fig1. First System Flow Diagram

Now consider one more scenario where we are working in the bank at high floor or do a shopping in biggest mall etc. means we are away from the our vehicle and a vehicle thief is trying to thief our car

which is already fitted with security system which only prompt with a sound alert which is not possible to hear at long distance.

Fig2 Second System Flow Diagram

We are trying to develop the system useful in case of above mentioned scenario. If there is an accident of vehicle, then the system will automatically activate itself but it will wait for one minute for user response. In case of user is out of danger and situation is under control then the user deactivate the system by own. In case of serious problem then the system will switch to emergency mode and send the message or call to registered mobile numbers along with the geographical position of the incident. The coordinates send by the system will help to find out the exact position of the vehicle on globe so that the emergency services will track the vehicle and can help with minimum amount of time.
Now a day's for the security purpose of a Car , manufacturers try to modify security system by implementing different technologies. Consider a condition user is far away from vehicle and theft detection siren start then user can't listen alert and he can't take any step..
We are trying to develop the system where vehicle automatically inform the user via phone call directly on user's phone and the system will automatically make a phone call on user's phone as the thief tries to thief the vehicle. User will then take necessary action to save the vehicle. In this case, other people will not be irritate because of sound created by sound siren. Another advantage of system is that the user is always reachable by vehicle security system.

II. PROPOSED WORK

A. Detection of car Location:

This is another advantage of the system that we can track the car location just by sending the mobile SMS or making the call . Owner car is less with GPS device so it is possible to locate the car location on Google map is very easy. Here user will send Preformatted SMS to car in response car system will use GPS device and collect the current car longitude and latitude and send back as a rely to the SMS. Now user get the car location as SMS now he can use these details to track the car on Google map using Google earth like software.

B. surveillance Car accident:

In day to day life we are facing many problems and many times we are helpless and need someone's assistance and which is not possible every time. Consider a situation we are going for long drive and suddenly we caught in critical condition it may be accident. If we are ok and can help ourselves then it is ok but what if we can't. Consider another condition if we found that our car has been stolen we can't do anything as quick action. We are having so many technologies to overcome such problem and provide artificial intelligent based system to assist human in such a condition. Consider a car had an accident the sensor will activated automatic and start it's surveillance mode. If user is ok and can help himself then he will stop surveillance mode within given time period else system will consider user need assistance and start auto contacting with call center and specified person. Once the system started in assistance mode first of all system will gather the car location using GPS device in the form of longitude and latitude. Then it records car details like car owner details, car number, car model, car speed if possible and convert this data in to formatted SMS and send this data to call center and person's relative where person need to provide contact person details manually before starting drive. Once the call center get the car status it will search

for nearest hospital, ambulance service ,police station and contact then to reach at accident location to help our the person.

Advantages

- It will send immediate reaction in case of accident & vehicle security breach or any emergency situation.
- It will help to find out the exact position of the vehicle.
- It will help to provide emergency responders with crucial information at the earliest possible time.
- Reducing the time between when an accident takes place and when it is detected can reduce mortality rates.
- Low cost solution and easy to installable in any type of vehicle .

III. METHODOLOGY

At the time of project installation, the registration number of vehicle along with relative's phone number, emergency services number feed into the source code of the system. Consider a car had an accident the sensor will activated automatically and start its surveillance mode. If user is not in critical condition and can help himself then he will stop surveillance mode within given time period else system will consider user need assistance and start auto contacting with call center and specified person. Once the system started in assistance mode first of all system will gather the car location using GPS device in the form of longitude and latitude. Then it records car details like car owner details, car number, car model, car speed if possible and convert this data in to formatted SMS and send this data to call center and person's relative where person need to provide contact person details manually before starting drive. Once the call center get the car status it will search to find nearest police station, hospital, ambulance service and contact then to reach at accident location to help the person.About vehicle security concern, when a vehicle is about to thief, the door is about to open, then a attached system automatically generate a phone call to the user registered mobile number. The moment the user received the call from the vehicle, user can send reply SMS to stop the car engine or can take any immediate action to

save the vehicle. This will provide immediate alert without any time delay so that proper action can performed within the period.

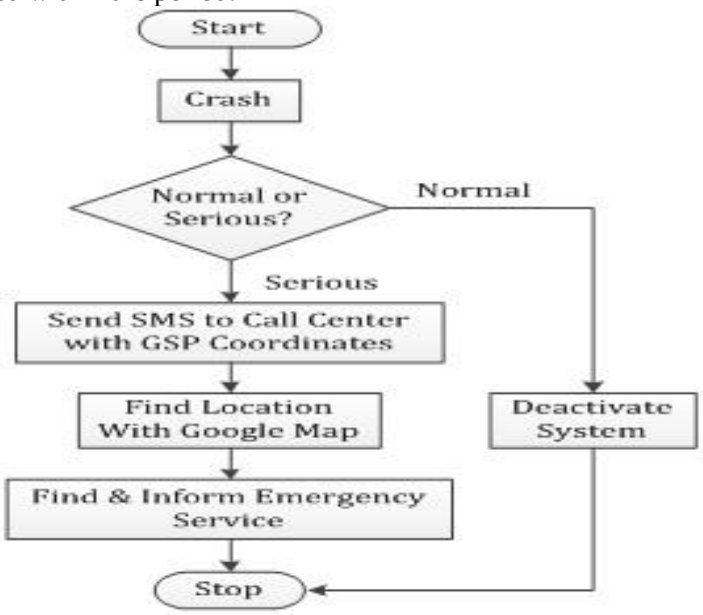

Fig. 3:Data Flow Diagram

IV. RELATED WORK

N. Watthanawisuth, T. Lomas and A.Tuantranontproposed Wireless black box using MEMS accelerometer and GPS tracking system has been developed for motorcycle accidental monitoring. The system can detect type of accident (linear and nonlinear fall) from accelerometer signal using threshold algorithm, posture after crashing of motorcycle and GPS ground speed. After accident is detected, short alarm massage data (alarm massage and position of accident) will be sent via GSM network.

The Limitation of this paper is as follows :

Car security is the major concern now a day's. Car manufacturers try to modify security system by implementing different technologies. Currently central locking system and also theft detection system is available in the vehicle these can alert car owner for theft detection.

Wireless in-complaint Box For Accident Analysis, Oscar S. Siordia, Isaac Martín de Diego, Cristina Conde, and Enrique Cabello proposed an accident analysis system based on an in-vehicle complaint EDR that allows the acquisition of multimedia content, considering the three main elements of traffic safety: vehicle, driver, and road[5].

Murugandhan and P.R.Mukesh proposed a web based vehicle tracking system using GPS [7] .This system was used in-vehicle and mobile tracking system.

V. CONCLUSION

The system that we can track the car location just by sending the mobile SMS or making the call to the car. A car had an accident the sensor will activated automatic and start it's surveillance mode.

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[8] F. A. Author is with the National Institute of Standards and Technology, Boulder, CO 80305 USA (corresponding author to provide phone: 303-555-5555; fax: 303-555-5555; e-mail: author@ boulder.nist.gov).