IMPACT: International Journal of Research in Engineering & Technology (IMPACT: IJRET)
ISSN(E): 2321-8843; ISSN(P): 2347-4599
Vol. 3, Issue 11, Nov 2015, 35-40

INTELLIGENT VEHICLE CONTROL USING WIRELESS IN TRANSPORTATION SYSTEM

T.ASHOK, N LOGESHKUMAR, R BANU PRIYA & D MAHALINGAM

Department of ECE, M. A. M School of Engineering, Trichirapalli, Tamil Nadu, India

ABSTRACT

A Wireless access technology in vehicular environments has to the improvement of road safety and a reduction in the number of fatalities caused by road accidents. The aim of this project is to prevent accident. When the heart beat of the person is in abnormal condition or if the person driving the vehicle taken alcohol the Embedded system will activates the Vehicle control system that will slow down the Engine and park the vehicle in the nearby lane. This system consist of RFID reader and finger print sensor is used to prevent non-licensees from driving and therefore causing accidents. It can identify the person going to drive the vehicle is the owner of the vehicle or not. If emergency call button is pressed the Embedded system will activates the level converter and it will sends the SMS to the owner indicating the position of the vehicle. Vehicle will stops automatically after sensing the person has drunken. Theft detection is identify with automation. To implement with Safe driving and collision avoidance.

KEYWORDS: Vehicle Control, Wireless

INTRODUCTION

Existing driving behavior models have a strong emphasis on the driver's cognitive components including aspects such as motivation, risk assessment, attention, compensation, capability, workload, individual traits and experience. Each existing model was designed specifically for a particular driving situation such as speeding or fatigue. This system defines a framework for a new context aware driving behavior model capable of predicting driver's behavior. This approach broadens the cognitive focus of existing driving behavior models to integrate contextual information related to the vehicle, environment, driver and the interactions between them. In this system embedded system plays a major role. This system consist of embedded system, alcohol sensor, eye blink sensor, lane detection sensor, heart beat sensor, ADC, signal conditioning unit, accident sensor, emergency call button, vehicle control system, vehicle, level converter, GSM modem, GPS receiver, RFID reader and finger print scanner.Vehicle Adhoc Networks (VANET) emerged as an application of Mobile Ad hoc Networks (MANET), which use Dedicated Short Range Communication (DSRC) to allow vehicles in close proximity to communicate with each other, or to communicate with roadside equipment. Applying wireless access technology in vehicular environments has led to the improvement of road safety and a reduction in the number of fatalities caused by road accidents, through the development of road safety applications and facilitating information sharing between moving vehicles regarding the road. This paper focuses on developing a novel and non-intrusive driver behavior detection system using a context-aware system in VANET to detect abnormal behaviors exhibited by drivers, and to warn other vehicles on the road so as to prevent accidents from happening. A five-layer context aware architecture is proposed which is able to collect contextual information about the driving environment, perform reasoning about certain and uncertain

contextual information and react upon that information. A probabilistic model based on Dynamic Bayesian Networks (DBN) for real time inferring four types of driving behavior (normal, drunk, reckless and fatigue) by combining contextual information about the driver, vehicle and the environment is presented.

PROPOSED SYSTEM SPECIFICATION

In this system embedded system plays a major role. This system consist of embedded system, alcohol sensor, eye blink sensor, lane detection sensor, heart beat sensor, ADC, signal conditioning unit, accident sensor, emergency call button, vehicle control system, vehicle, level converter, GSM modem, GPS receiver, RFID reader and finger print scanner.GSM and GPS based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting this information value and adds by improving the level of service provided. A GPS based vehicle tracking system will inform where your vehicle is and where it has been, how long it has been. The system uses geographic position and time information from the Global Positioning Satellites. The system has an “On Board Module" which resides in the vehicle to be tracked and a "Base Station" that monitors data from the various vehicles. The On Board module consists of GPS receiver, a GSM modem.

The Alcohol Sensor is used to sense weather the person driving the car taken Alcohol or not and this data is also given to ADC, The ADC is used in this system because the signal comes from the Sensors are analog in nature, so we want to convert the Analog signals into digital signal for this purpose ADC is used. Heart Beat sensor used in the system is used to sense the heart beat of the person driving the car and sends the data to the embedded system, and the eye blink sensor is used to sense the person driving the vehicle is sleeping or not. Accident sensor is used to identify weather the vehicle is running in normal condition or not when the accident occurs it send the information to the embedded system . The Embedded system is programmed like when it receives the signal from the signal sensor it activates the Vehicle system control system and level converter unit. Level converter is used in this circuit to convert the logic of the signal comes from the Embedded system that is acceptable by the GPS and GSM modem.GPS receiver is used to find the current location of the vehicle. All the sensor value and GPS location are given to embedded system, the embedded system will sends the data’s to the particular mobile number through SMS. When the heart beat of the person is in abnormal condition or if the person driving the vehicle taken alcohol the Embedded system will activates the Vehicle control system that will slow down the Engine and park the vehicle in the near by lane the lane detection sensor will do this function. At the same time An SMS is send to the hospital that a person needs help and it also indicates the location of vehicle so it is easy to ambulance to reach the place. And also this system consist of RFID reader and finger print sensor is used to identify the person going to drive the vehicle is the owner of the vehicle or not. And if emergency call button is pressed the Embedded system will activates the level converter and it will sends the SMS to the nearby hospital indicating the position of the vehicle.

TYPES OF SENSORS

ALCOHOL SENSOR: A gas detector is a device which detects the presence of various gases within an area, usually as part of a safety system. This type of equipment is used to detect a gas leak and interface with a control system so a process can be automatically shut down. A gas detector can also sound an alarm to operators in the area where the leak is occurring, giving them the opportunity to leave the area. This type of device is important because there are many gases that can be harmful to organic life, such as humans or animals.

GPS SENSOR: GPS trace of one test run. The direction of driving on the course was counter-clockwise, implicating 4 left-curves and a slight ”s-shaped” turn in one lap. Each has a length of about 1,150 meters and a laptime of ≈ 38 seconds (and therefore average speed of ≈ 108km/h). Test runs (as well as recordings) started at the service garage.

HEARTBEAT SENSOR: Heart rate is a term used to describe the frequency of the cardiac cycle. It is considered one of the four vital signs. Usually it is calculated as the number of contractions (heart beats) of the heart in one minute and expressed as "beats per minute" (bpm). See "Heart" for information on embryofetal heart rates. The heart beats up to 120 times per minute in childhood. When resting, the adult human heart beats at about 70 bpm (males) and 75 bpm (females), but this rate varies among people. However, the reference range is normally between 60 bpm (if less termed bradycardia) and 100 bpm (if greater, termed tachycardia). Resting heart rates can be significantly lower in athletes. The infant/neonatal rate of heartbeat is around 130-150 bpm, the toddler's about 100–130 bpm, the older child's about 90–110 bpm, and the adolescent's about 80–100 bpm.

FINGERPRINT SENSOR: A fingerprint in its narrow sense is an impression left by the friction ridges of a human finger.In a wider use of the term, fingerprints are the traces of an impression from the friction ridges of any part of a human hand. A print from the foot can also leave an impression of friction ridges. A friction ridge is a raised portion of the epidermis on the fingers and toes (digits), the palm of the hand or the sole of the foot, consisting of one or more connected ridge units of friction ridge skin. These are sometimes known as "epidermal ridges" which are caused by the underlying interface between the dermal papillae of the dermis and the interpapillary (rete) pegs of the epidermis. These epidermal ridges serve to amplify vibrations triggered, for example, when fingertips brush across an uneven surface, better transmitting the signals to sensory nerves involved in fine texture perception. These ridges also assist in gripping rough surfaces, as well as smooth wet surfaces.

Figure 1: Fingerprint being Scanned

FEATURE EXTRACTION

The extracted features are calculated over a 10 second time window, based on the fact that there is a time delay betweenthe external stimulus (driving event) and the corresponding response changes in the selected biosignals. This time window is a significant factor, since it determines how often updates about the driver state are provided. The objective of a real time or near real time approach is to recognize correctly the driver stress (high classification rate) and in real time (high sensitivity). The former suggests a large window size, to minimize variance in the features within a class. On the contrary, the latter suggests a small window size. A time window of 10 seconds has been identified as a suitable compromise between these two arguments [19]. The following features are extracted:

Heart Rate Variation from Baseline (HRvB): It provides the instant variation of the heart rate from the estimated baseline:

- The mean heart rate of each 10 second segment is calculated producing a new time series hr.
- A moving average is applied on hr Having computed the baseline, the heart rate variation

MATLAB

MATLAB is a high-level language and interactive environment for numerical computation, visualization, and programming. Using MATLAB, we can analyze data, develop algorithms, and create models and applications. The language, tools, and built-in math functions enable you to explore multiple approaches and reach a solution faster than with spreadsheets or traditional programming languages, such as C/C++ or Java™.

PERFORMANCE

- Linear algebra functions on computers with new AMD processors.
- Doing current research for the simulation output

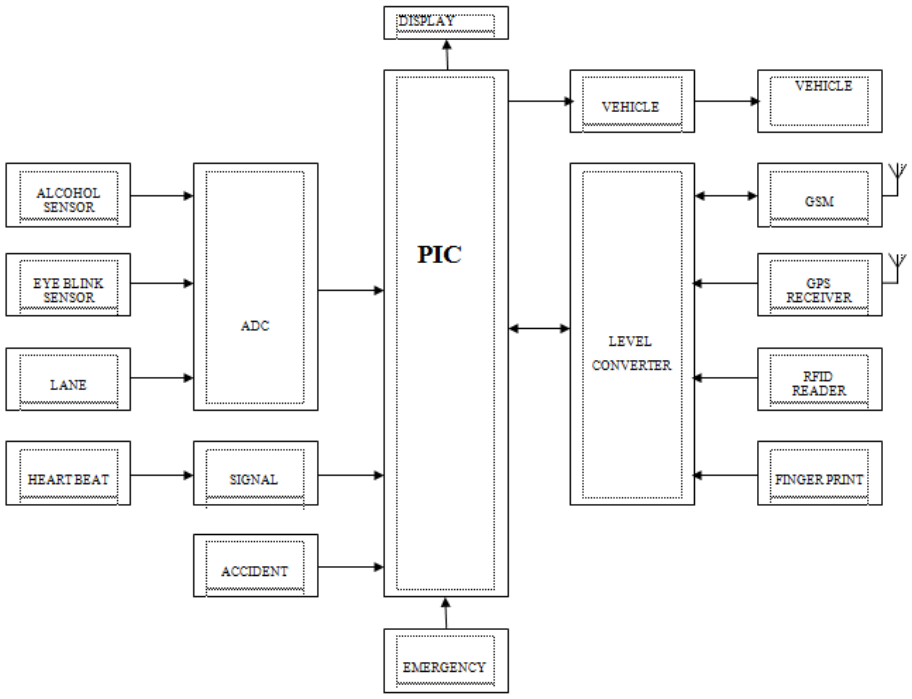

Figure 2: Intelligent Vehicle Control Using Wireless in Transportation System

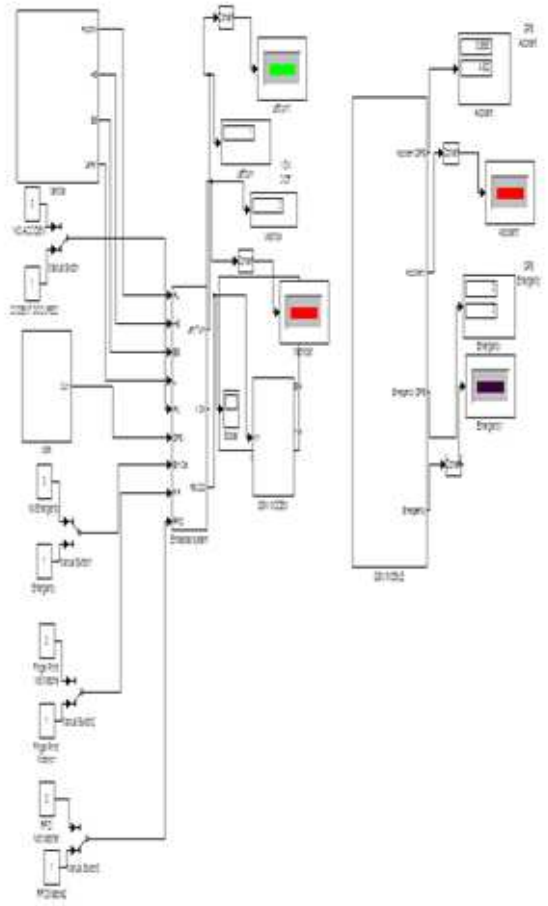

Figure 3: Simulation Result of Intelligent Transportation System

CONCLUSIONS

The progress in technology about intelligent transportation is non-stop process. In this system is fully prevent accident in real time. It will be fully automatic control. It saves time as well as control this also helps to maximize profit margin in utility company working in vehicle manufacturing. This system defines a framework for a new context aware driving behavior model capable of predicting driver's behavior. This approach broadens the cognitive focus of existing driving behavior models to integrate contextual information related to the vehicle, environment, driver and the interactions between them.GSM and GPS based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting this information value and adds by improving the level of service provided. This work mainly focus to implement the software simulation of the hardware modules using MATLAB. In future enhancement will be provided for safety and security of vehicle. It will fully avoided for vehicle theft. It will bypassing of vehicle when the collision of traffic occurring in it.

REFERENCES

1. U. D. for Transport. (2011) Reported road casualties in great britain: Quarterly provisional estimates q1 2011. [Online]. Available: http://www.dft.gov.uk/statistics/releases/ road-accidents-and-safety-quarterly-estimates-q1-2011

2. S. Olariu and M. C. Weigle, Vehicular Networks: From Theory to Practice. Chapman & Hall/CRC, 2009.
3. Y. Qian and N. Moayeri, “Design of secure and application-oriented vanets,” in Proc. IEEE VTC, May 2008, pp. 2794 –2799.
4. N. H. T. S. Administration, “Vehicle safety communications project task 3 final report, identify intelligent vehicle safety applications enabled by dsrc,” U.S. Dep. of Trans., Tech. Rep. DOT HS 809 859, 2005.
5. J. Sun, Y. Zhang, and K. He, “Providing context-awareness in the smart car environment,” in Proc. IEEE CIT, Jul. 2010, pp. 13 –19.
6. A Rakotonirainy, “Design of context-aware systems for vehicle using complex systems paradigms,” in Proc. Workshop on saf. and cont. in conj. with CONTEXT, Paris, France, 2005, pp. 464–475.
7. M. S. Devi and P. R. Bajaj, “Driver fatigue detection based on eye tracking,” in Proc. IEEE ICETET, Nagpur, Maharashtra, Jul. 2008, pp. 649 –652.
8. H. Singh, J. S. Bhatia, and J. Kaur, “Eye tracking based driver fatigue monitoring and warning system,” in Proc. IEEE IICPE, New Delhi, India, Jan. 2011, pp. 1 –6.
9. Z. Zhu and Q. Ji, “Real time and non-intrusive driver fatigue monitoring,” in Proc. IEEE ITSC, Oct. 2004, pp. 657 – 662.