Care Pilot: Propelled Driver Safety Awareness and Assistance System for Cognitive Vehicle Control

[1]Pankaj Kumar Sinha and [2]Preetha Sharan
[1]Department of EEEM, AMET University, Chennai, India
[2]Department of Electrical and Electronics Engineering,
Oxford College of Engineering and Technology, Bangalore, India

Abstract: These days, wellbeing has turned out to be a standout amongst the most imperative characteristics of a vehicle. A cutting edge vehicle has a plenty of dynamic driver help frameworks, for example, journey control, crash shirking, programmed stopping and steadiness control and so forth. These frameworks are intensely centered around vehicular control angle. Be that as it may, exploratory and certifiable review demonstrates the main driver of lion's share of mischance's can be followed back to the conduct of the person who drives the vehicle, the driver himself. The venture proposed here intends to outline a propelled driver security mindfulness and help framework that will screen the driver and charge the vehicle to take those crucial wellbeing measures keeping in mind the end goal to conquer the significant issues said above.

Key words: Vehicle, goal, conquer issuss, above, crucial, mind

INTRODUCTION

Presently, automotive manufacturers develop more active safety features to avoid car accidents, it is equally important to develop cost-effective technological solutions that can accurately identify the driving behavior of drivers and to assist them is studied in the papers (Kang, 2013; Singh and Papanikolopoulos, 1999; Ueno *et al.*, 1994). Many automotive companies have created driver monitoring systems previously. Most of them will check and alert a driver who is falling asleep using camera based eye blink sensing technology. But this is a very narrow solution because: it does not prevent mobile phone usage while driving which is a major cause of accident these days. It does not identify driver fatigue condition which is the primary reason that results in less concentration on road, one of which is sleepy driving case. No knowledge of whether a driver is drunken alcohol or not. There is no way to find if a collision is about to happen or not. That would have allowed the vehicle to the driver. No autonomous way to know the accident spot in order to get early help that might save life.

MATERIALS AND METHODS

In the study of Bagni *et al.* (2008), the project proposed here aims to design an advanced driver safety awareness and assistance system that will monitor the driver and command the vehicle to take those vital safety measures in order to overcome the serious problems mentioned above.

Features and description: The venture highlights the accompanying modules.

Mobile baseband monitor: Any movement in driver's cell phone for example, going to approaching calls, making active calls and SMS messaging will be effectively checked utilizing the worked in Mobile baseband sensor circuit and in the event that it finds any action while the vehicle is running, it will be backed off to an end by applying the brakes naturally (Bekiaris *et al.*, 2004). The driver can recapture the vehicle control by essentially squeezing the brake pedal. The accelerator pedal sensor and brake pedal sensor alongside a DC motor controlled wheel are utilized to exhibit a running vehicle. The vehicle efficiency is analyzed in the enhancement of fuel consumption and efficiency of the vehicles (Elavarasi and Kumar, 2017).

Hands free auto reply SMS: The framework has a GSM modem with SIM card. The driver needs to enact call redirect to this number before entering this mode. In this mode, after getting an approaching call while driving, the GSM modem naturally sends a SMS to the calling number with a settled message showing that the individual has
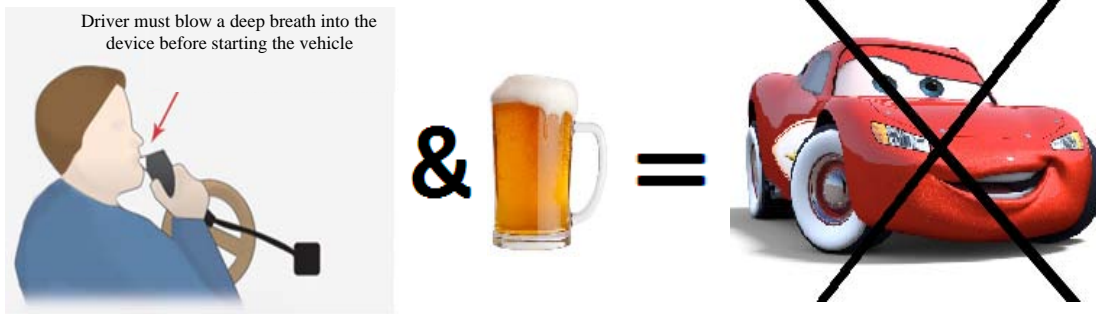
Fig. 1: Drunken drive detection

Fig. 2: Mobile baseband monitor

been driving. The framework has a dashboard graphics LCD that can demonstrate the calling number. This makes the driver 100% hands free (Fig. 1 and 2).

Driver fatigue warning: This component gives a technique to identifying the early indications of exhaustion/laziness amid driving. By dissecting some organic and natural factors, it is conceivable to identify the loss of readiness before the driver nodding off. The framework will then decide whether the subject can drive. Heart Rate Fluctuation (HRV) and directing wheel grasp weight are utilized to appraise the driver's exhaustion level. A computerized beat yield heart rate sensor measures HRV and a simple yield flexi force pressure sensor measures the directing wheel grasp constrain and the notice is issued with Buzzer and LED lights. In the event that the driver overlooks this notice and keeps on driving then the framework will apply brakes naturally to back off and end the vehicle (Fig. 3). Furthermore, the framework can likewise be set for intermittent reminder utilizing a keypad catches and the dashboard graphics LCD. The under water applications based vehicles are presented in the remote operated underwater welding vehicle (Karthik, 2016).
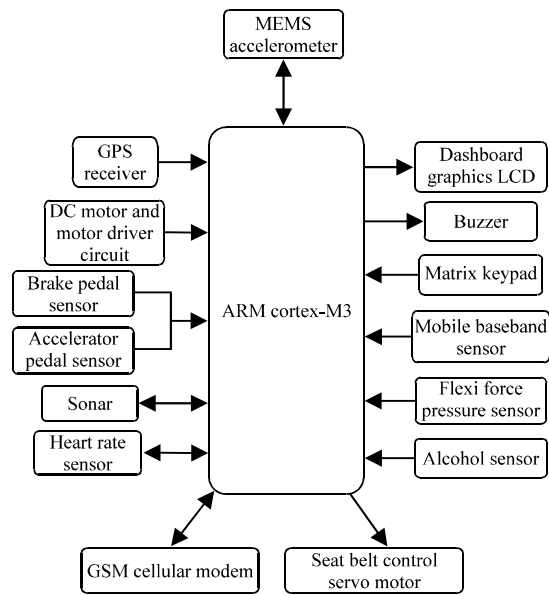

Fig. 3: Block diagram of care pilot

Drunken drive prevention: The framework has a worked in liquor testing highlight which would teach the driver to blow air into the sensor unit and checks the liquor content present in the drivers relax. On the off chance that the esteem has crossed a specific utmost the vehicle start will be bolted which keeps a smashed driver from beginning the vehicle. An alcohol sensor unit is incorporated into the framework for this reason.

Software tools used:
- Programming language
- Embedded C
- Development tool
- LPCXpresso IDE (Eclipse based)

RESULTS AND DISCUSSION

Collision presafe activation: Collision presafe is a car security framework intended to lessen the seriousness of
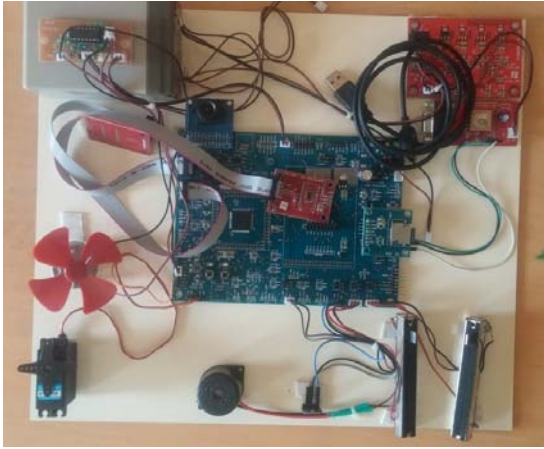
Fig. 4: Care pilot kit

a mischance. It utilizes beat yield SONAR to distinguish an impending accident and has three cautioning stages. The primary cautioning stage incorporates perceptible and visual notices to brake (Fig. 4). In the event that overlooked and if the framework predicts an impact is unavoidable, fixes the safety belt utilizing the inbuilt servo motor component giving safety belt insurance and programmed use of the brakes to diminish the seriousness of the anticipated crash.

GPS and GSM based acident/panic alert: During a crisis circumstance the driver can demonstrate his area to outside world utilizing a basic frenzy catch. By squeezing this catch, the driver can send a SMS about his ebb and flow area data to a prestored number. Additionally in case of a crash, the framework detects that utilizing 3-axis digital MEMS accelerometer sensor and will consequently create a comparable SMS to a prestored number about the crash area data. GPS and GSM modules are utilized for this reason. All the venture modules and elements are controlled by methods for LPC1313, a 32 bit ARM Cortex-M3 microcontroller from N×P semiconductors.

Applications:
- Our project implements several related concepts of driver vigilance and driver safety in the field of cognitive vehicles
- Provides superior safety by integrating the driver monitoring system into the vehicular control system
  Mobile baseband monitor is applied only to the driver's mobile phone by reducing the detection range to 1 m from the sensor
- Hands free auto reply SMS is an innovative feature provides zero disturbance to the driver

CONCLUSION

In this study, we concentrate the issues and difficulties of wellbeing cautioning message trade for the context aware driver assistance system. When all is said in done, driver help framework requests a typical area understanding for scene portrayal to empower data trade amongst vehicle and driver. The execution of the reproduced setting I-DAS security notices in best, most exceedingly bad and normal case situations is talked about. The displayed approach demonstrates the reproduction that can be executed progressively situation as DVI which produces promising outcomes and shows the plausibility of joining the upsides of cosmology with the thinking energy of rationale based dialects.

REFERENCES

Bekiaris, E., S. Nikolaou and A. Mousadakou, 2004. System for effective assessment of driver vigilance and warning according to traffic risk estimation. Centre for Research and Technology Hellas, Greece, Balkans.

Elavarasi, R., P.K.S. Kumar, 2017. Enhancement of fuel consumption and efficiency of the vehicles. Intl. J. Mech. Eng. Technol., 8: 456-460.

Kang, H.B., 2013. Various approaches for driver and driving behavior monitoring: A review. Proceedings of the IEEE International Conference on Computer Vision Workshops, December 1-8, 2013, IEEE, Sydney, Australia, pp: 616-623.

Karthik, S., 2016. Remote operated underwater welding vehicle. Proceedings of the 21st Symposium on Offshore Emerging Offshore Technology and Deepwater Trends, February 16, 2016, Society of Naval Architects and Marine Engineers, Houston, Texas, ISBN: 9781510826434, pp: 532-539.

Singh, S. and N.P. Papanikolopoulos, 1999. Monitoring driver fatigue using facial analysis techniques. Proceedings of the IEEE/IEEJ/JSAI International Conference on Intelligent Transportation Systems, October 5-8, 1999, Tokyo, pp: 314-318.

Ueno, H., M. Kaneda and M. Tsukino, 1994. Development of drowsiness detection system. Proceedings of the Vehicle Navigation and Information Systems Conference, August 31-September 2, 1994, Yokohama, Japan, pp: 15-20-10.1109/VNIS.1994.396873.