ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 3, March 2019

Advanced Driver Assistant System with AI Control Machine

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ABSTRACT: A new approach towards automobile safety and security with independent region based automatic car system is proposed in this concept. We propose three distinct but closely related concepts namely, a Drowsy Driver Detection system and a traffic detection system with external vehicle violation avoidance based concept. In recent time's automobile fatigue related crashes have really magnified. In order to minimize these issues, we have incorporated driver alert system by monitoring both the driver's eyes as well as sensing as well as the driver situation based local environment recognition based AI system is proposed.

KEYWORDS:DSM,EAR ,AI

I. INTRODUCTION

Self-driving cars are technologically a reality and in the next decade they are expected to reach the highest level of automation. While there is general agreement that an advanced human-autonomous vehicle interaction is key to achieve the benefits of self-driving cars, it is less clear what role artificial intelligence should play in this context. It focuses on virtual assistants, the personification of the car intelligence incorporating, among others, an algorithmic "brain", a synthetic human "voice" and powerful sensor-based "senses". Should virtual assistants just assist humans or replace them whenever necessary Should their scope of action be limited to safety-related driving tasks or to any activity performed in the car or controlled from the car Although at a very early stage of commercial development, the paper will review the state-of-the-art of in-car virtual assistants underlining their role and functions in the connected and automated driving ecosystem. By drawing from earlier reflections on automation, robots and intelligent agents, it will then identify a series of issues to be addressed by the scientific community, policy-makers and the automotive industry stakeholders. The tasks in which the system takes over from the human driver are the following: execution of steering and acceleration/deceleration; monitoring of driving environment; fallback performance of dynamic driving task; system capability.

DSM systems provide the drivers with warning for the drowsiness or fatigue. The DSM systems mainly uses a camera sensor installed on near dashboard, which estimates the eye blink, head poses, or pupil states in the image from the camera . The driver state monitoring system which detects the drowsiness or inattention of the driver, and alarm the driver to be attention to driving. The DSM system must provide a warning to the driver to prevent accidents in the driving environment where the vehicle is moving at high speed, so the drowsiness detection algorithm have to provide high detection ratio and real-time processingwe focused on more fast and accurate drowsiness detection algorithm using a camera sensor which senses the driver's face region. Also, we use an infrared camera which can obtain stable image frames at night as well as day time.

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II.PROPOSED METHOD

The block diagram of the proposed method is shown in figure 1.It consists of threemain units.

(A) Driver Assistance system with camera
(B) Vehicle external vehicle availability detection
(C) Vehicle detection-based attention

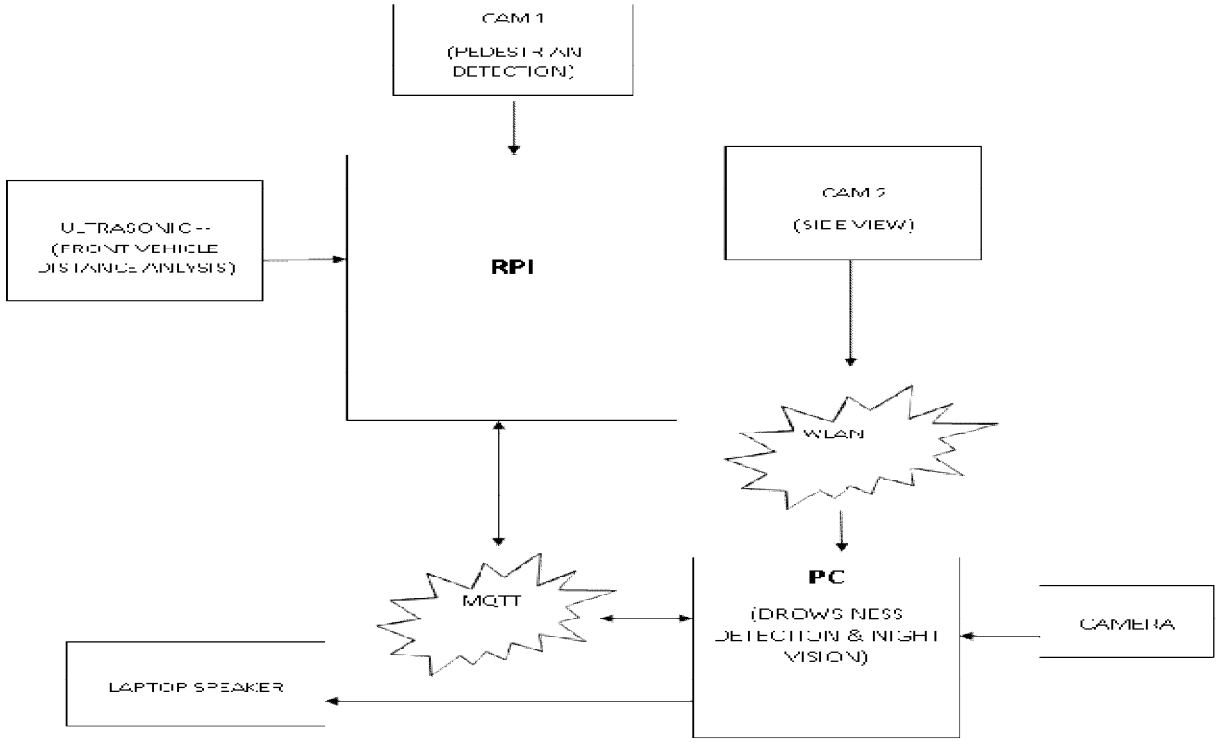

Figure 1:Block diagram of proposed system

(A)Ultrasonic sensor:

An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. It is important to understand that some objects might not be detected by ultrasonic sensors.

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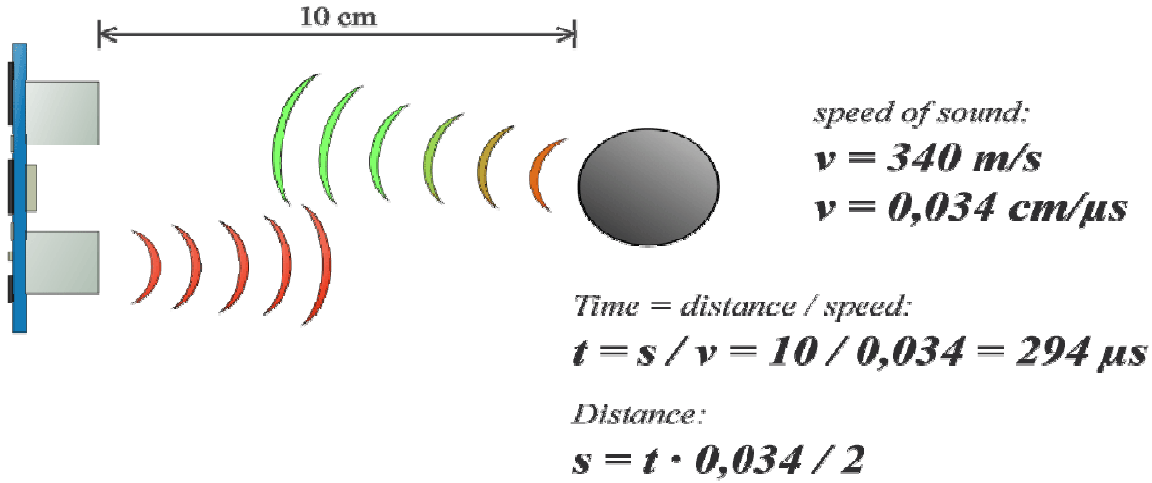
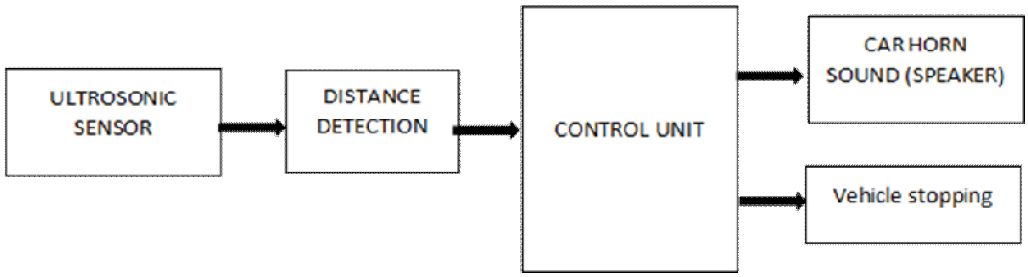


(B)MQTT:

MQTT (**Message Queuing Telemetry Transport**) is an based messaging protocol. It works on top of the TCP/IP protocol. It is designed for connections with remote locations where a "small code footprint" is required or the network bandwidth is limited.An MQTT system consists of clients communicating with a server, often called a "broker". A client may be either a publisher of information or a subscriber. Each client can connect to the broker.MQTT sends connection credentials in plain text format and does not include any measures for security or authentication. This can be provided by the underlying TCP transport using measures to protect the integrity of transferred information from interception or duplication.

(C)DISTANCE MEASUREMENT:



(D)CONTROL UNIT:

The **control unit** (CU) is a component of a computer's central processing unit (CPU) that directs the operation of the processor. It tells the computer's memory, arithmetic and logic unit and input and output devices how to respond to the instructions that have been sent to the processor. It directs the operation of the other units by providing timing and control signals. Most computer resources are managed by the CU. It directs the flow of data between the CPU and the other devices.

(E)RASHBERRY PI:

The Raspberry Pi is a series of small single board computer developed in the United kingdom by the Raspberry Pi Foundation, to promote teaching of basic computer science in schools and in developing countries. Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3 Model B+; on-board memory ranges from 256 MB to 1 GB RAM.Secure Digital (SD) cards in MicroSDHC form factor (SDHC on early models) are used to store the operating system and program memory.

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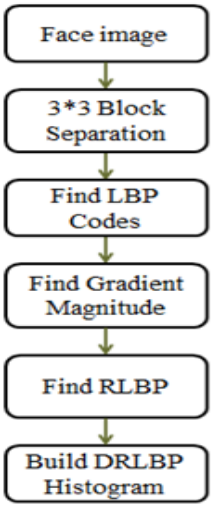
(F)W-LAN:
A wireless LAN (WLAN) is a wireless computer network that links two or more devices using wireless communication to form a local area network (LAN) within a limited area such as a home, school, computer laboratory, campus, office building etc. This gives users the ability to move around within the area and yet still be connected to the network. Through a gateway, a WLAN can also provide a connection to the wider Internet.

EYE ASPECT RATIO(EAR):
The eye aspect ratio is instead a much more elegant solution that involves a very simple calculation based on the ratio of distance between facial landmarks of the eyes.

$$EAR = (A + B) / (2.0 * C)$$

(G)DRLBP Descriptor:



The descriptor local binary pattern is used to compare all the pixels including the center pixel with the neighboring pixels in the kernel to improve the robustness against the illumination variation. An LBP code for a neighborhood was produced by multiplying the threshold values with weights given to the corresponding pixels, and summing up the result.

III.RESULT AND ANALYSIS

The development of environment perception and modeling technology is one of the key aspects for intelligent vehicles. This paper presents an overview of the state of the arts of environment perception and modeling technology. First, the pros and cons of vehicular sensors are presented. Next, popular modeling methods and algorithms of lane and road detection, traffic sign recognition, vehicle tracking, Drowsiness detection and behavior analysis, and scene understanding are reviewed. Public datasets and codes of environment perception and modeling technology are also described. Current challenges for environment perception and modeling technology are due to the complex outdoor environments and the need of efficient methods for their perception in real time. The changeable lighting and weather conditions, and the complex backgrounds, especially the presence of occluding objects still represent significant challenges to intelligent vehicles. Furthermore, it is very important to recognize road in the off-road environment. Since

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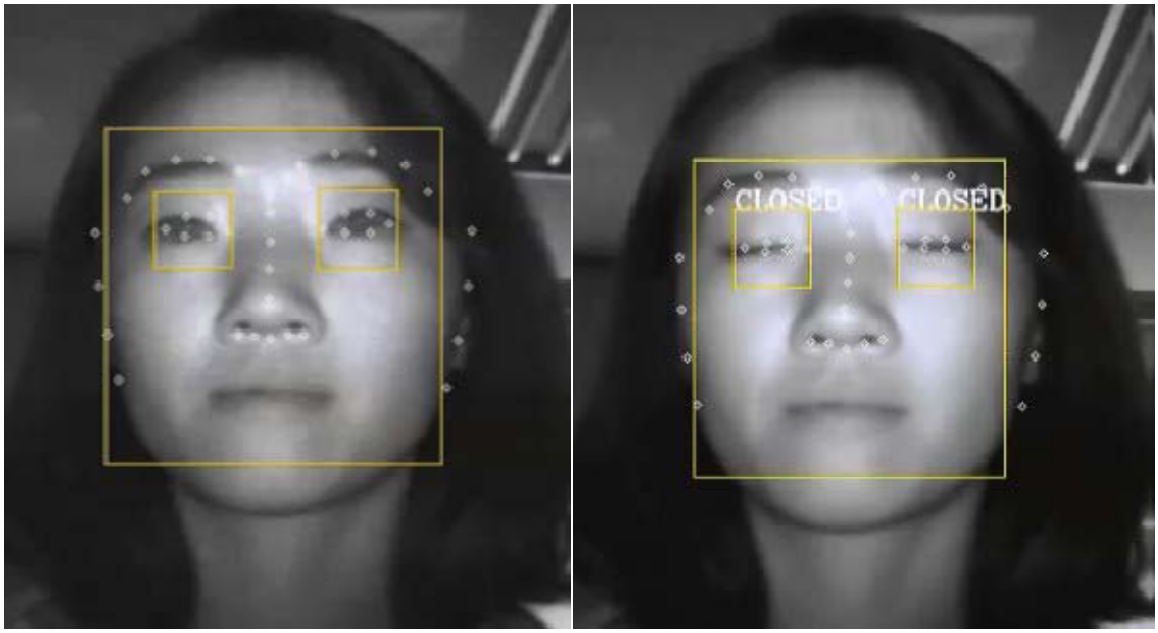
environment perception and modeling technology stage is the link with the work of localization and map building, path planning and decision-making, and motion control, the next step is to develop the entire system.



IV .CONCLUSION

The main aim of this paper is to develop a automobile safety and security with autonomous region based automatic car system.we proposed three distinct but closely related concepts viz. a drowsy driver detection system and a traffic detection system with external vehicle intrusion avoidance based concept.we have to incorporated driver alert system by monitoring both the driver's eyes as well as sensing as well as the driver situation based local environment recognition based AI system is proposed.

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