DRIVING ASSISTIVE SYSTEM: A REVIEW

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ABSTRACT
Driver assistance systems are developed to automate and enhance vehicle safety and better driving. There are many forms of assistance system available; some features are built into vehicles or are available as an add-on package. For the past hundred years, innovation within the automotive sector has brought major technological advances, leading to safer and affordable vehicles. Now in early decades of 21th century, the industry appears to be on cusp of revolutionary change. In current scenario, driving is one of the most research things need to be automatized. The current situation includes various problems faced by driver, mainly due to denser traffic, longer travel timings etc. Its high time to make them autonomous or self-driving vehicles . A review on DAS has been presented in this paper.

KEYWORDS: Driving assistive system, Pie-Drive

I. INTRODUCTION

Driving assistance system, are developed to automate systems for safety and better driving. They have features that provide essential information and automate difficult tasks with the goal of engendering an overall increase in vehicle safety for everyone on the road. Safety features are designed to avoid collisions and accidents by offering technologies that alert the driver to potential problems. They are one of the fastest growing segment in automotive electronics. Some driving assistance systems have been around for a long time, and they have already proven time and again to result in an improved driving experience. By this time number of advanced driver assistance system is constantly increasing. These are the systems to help the driver in the driving process. Many advanced driver assistance systems are right on the bleeding edge of emerging automotive technologies. They includes various adaptive features like incorporate GPS, connect to smartphones by making use of GSM module thus alerting driver to other cars or dangers. In this the vehicle has its movements based upon various kinds of maneuvers.

The basic maneuvers can be used to make more complex movements. This system can also be based on the idea of separated input and output. These systems can be given inputs in various forms like by operating it through phone or by developing some kind of application based on simple logic. Thus providing more flexibility to the user. New automotive active-safety system could provide a route to autonomous cars. The availability and sophistication of new automotive safety systems, collectively known as advanced driver-assistance systems. More and more vehicles boast features that assists drivers and eliminate errors. Ultimately, the proliferation of various features could provide a route to autonomous cars and even help prepare vehicles for a fully autonomous world.

Organization: The paper consists of four sections. The first section gives the brief introduction. Second section comprises of literature survey of various authors. Third section gives advantages of reviewed system and fourth section is concluding part.

II.   LITERATURE SURVEY

Ashwini.et.al[1] In her research paper author proposed controlling a robot through an android phone an easy and innovative idea. Her research work includes use of DTMF with GSM modules for designing a robot. Early robots have various limitations like limited frequency range, limited working range. Her research focused on developing a robotic vehicle with its multi-tasking features by making use of DTFM technology. They made a algorithm that was a fuzzy logic based robots with ultrasonic sensors. GSM module being interfaced with robot provide text alert immediately to called person during detection of obstacle and fire. Sensors input as well as DTMF inputs are given are given to microcontroller and hence it is programmed in such a way that it will drive the motors according to input as well as will send a SMS to pre- defined cell phone number after applying power supply. The main feature of this robot is that it is password protected and authenticated.

Awab Fakih.et.al[2] In this author described about remote vehicle control . A hand held mobile phone is used as a transmitter. The receiver is a robotic car that includes a mobile phone on auto answer mode, DTMF decoder, microcontroller and motor drivers. The control of robots involves three distinct phase namely perception, processing and action. The sensors are mounted on the robot. The processing is done by on-board microcontroller or processor, and action is performed using motors Dual tone multi-frequency signaling is used for telecommunication signaling in the voice frequency bands. In order to control robot, one need to make a call to cell phone attached to it from any phone, which sends DFTM tunes on pressing numeric buttons. By developing a cell phone operated robotic car, they have overcome the drawbacks of conventionally used RF circuits. This includes advantages such as robust control, minimal interference and large working range. The car requires various commands for motion control.

Archit Saxena.et.al[3] In his research paper author described how a Bluetooth controlled robot can perform the necessary actions by receiving a set of instructions in the form a Short Message Service (SMS). In this project he controlled the robot directions like forward, backward, left and right by sending SMS using an android application named as PIDRIVE from the mobile.

His papers mainly consist of two sections, one is mobile unit which has an android based application PIEDRIVE and the other one is robot unit. The Blue-tooth modem which is fixed at the robot receives the messages sent by the mobile and gives the instructions to the microcontroller to control the robot directions. In this project, they interface Atmega 328 microcontroller with Bluetooth module. The protocol used for the communication between controller and blue-tooth modem is UART (Universal Asynchronous Receiver-Transmitter). This system continuously checks for message to take the decision for controlling the robot.

Jong Hoon.et.al[4] His research papers outlines the strategy adopted for establishing two kinds of communications; one for wireless communication between a mobile Robot and a remote Base Station, another for serial communication between a remote Base Station and a GUI Application, PC. TekBot is a low cost mobile Robot built by Oregon State University which in its current version requires wired communication. His aim is to be able to command and control the Robot wirelessly by the GUI Application. The main task of this project is two parts: (1) to program the AVR microcontroller on both the Base Station and the Robot interfaced to the radio packet controller module which would enable us to wirelessly control the Robot; (2) to program the GUI

Application which would enable us to serially control the Base Station.

Theoretical system limitation for the packet transmission is evaluated and analyzed. He tested packet stress to the wireless module while varying the number of Robots and the payload data. The wireless parts were evaluated with CRC error checking. As a result, we achieved control both wireless communication between the mobile Robot and the remote Base Station, and serial communication between the remote Base Station and the GUI Application. This level of completely was successfully tested on groups at up to four Robots. Hence the wireless communication and the serial communication were successful in the downlink.

The principle task of this project was to program the AVR microcontroller interfaced to a radio packet controller module (operating at a frequency of 433 MHz) which would enable us to wirelessly control the Robot. The communication protocols dealing with transmission and reception of data and wireless control of the TekBot have been successfully implemented.

Max donath.et.al[5]In his papers author describes the design , development and the evaluation of a Head Up Display system for drivers of ground based vehicles. The HUD, which projects which visual information into the driver's forward looking visual field, is an ideal driver assistive device Who must drive under degraded visual conditions. The HUD was programmed to draw appropriate perspective projections of the road boundaries as seen from the driver's viewpoint as calculated from dynamic position measurement provided by differential GPS.HUD was developed to provide an intuitive adjunct that provides a high fidelity reconstructed image of essential aspects of visual field superimposed on actual field of view. The mismatch error between the projected and the real road boundaries was measured and analysed.

B. Nivetha.et.al[6] In her paper author proposed driver drowsiness is the major issue behind accidents. To solve this issue many techniques are used. A new car safety system that anticipates what the driver is about to do a few seconds before it happens, to prevent those behind the wheel from committing mistakes. By observing the driver's body language and considering that in context of what happening on the road, a computer algorithm can determine the probability that the driver will turn or change lanes. The drowsiness detection fatigue is involves sequence of images of a face. The requirements for an effective drowsy driver detection system are as follows: A non-intrusive monitoring system that will not distract the driver. A real time monitoring system, to insure accuracy in detecting drowsiness. The fatigue monitoring can be starts with extracting visual parameters. This can be done via a computer vision system. In the purposed work, author purpose a real time robust methods for eye tracking under variable lighting conditions and facial orientations. The tracking is based on the eye appearance. Visual information is acquired using a specially designed solution combining a CCD video camera with an IR illumination system. The system is fully automatic and detects eye position and eye closure and recovers the gaze of eyes. Experimental results using real images demonstrate the accuracy and robustness of the proposed solution.

Mashood Mukhtar.et.al[7] In his work author has presented a vehicle tracking system that employs a GPS module and a GSM modem to find the location of a vehicle and offers a range of control features. To complete the design successfully, a GPS unit, two relays, a GSM Modem and two MCU units are used. There are five features introduced in the project. The aim of this project is to remotely track a vehicle's location, remotely switch ON and OFF the vehicle's ignition system and remotely lock and unlock the doors of the vehicle. An SMS message is sent to the tracking system and the system responds to the users request by performing appropriate actions. Short text messages are assigned to each of these features. A webpage is specifically designed to view the vehicle's location on Google maps. By using relay based control concept introduced in this paper, number of control features such as turning heater on/off, radio on/off etc. can be implemented in the same fashion. The design of the tracking system is divided into three parts; basic design, intermediate design and an advance Design. The basic design of the vehicle tracking system consists of a GSM module, a GPS module, a MCU (ATMEL), a Relay circuit and a LCD. The user sends SMS and the system responds to the user's request by providing the coordinates of a location in accordance to the requirements of mobile phone users through the GPRS network. The intermediate and advance design is an improvement of the basic design

III.   ADVANTAGES OF DRIVING ASSISTANCE SYSTEM

1- These type of system can prove to be an aid for people with some disability.
2- They can be helpful in developing automotive and enhanced vehicle system thus providing more flexible driving.
3- They can be advantageous in remote vehicle control.
4- Can be used to develop robotic vehicle with multitasking features thus reducing human efforts.
5- Helps in using renewable source of energy.

IV.   CONCLUSION

Its need of hour to develop and implement these assistive systems in order to make driving more flexible. The main emphasis is laid on making it reachable to each and every vehicle. The various features can be added to it so that driving can become more adaptive, user friendly and advanced. It can serve as aid in some cases. Its prototype can be developed to make the vehicles automated or self -

driving. Some easy and innovative ideas can be presented in controlling the vehicles through these assistive technology. Thus helping in developing a good project that have potential to do different tasks.

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