

Autonomous Handicapped Vehicle Using IOT and Arduino Operations

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ABSTRACT: This is a self driven automatic car, It does not need any driver to drive it ,The Arduino ,GPS ,GSM module are some of the main things which make this possible. Through the voice command it automatically reach the destination point where handicapped people willing to reach.This car has a liDar sensor or HC SR04 which is the most important thing inside. Through this the handicapped vehicles satisfies people without any accidents.

KEYWORDS: Arduino, IOT, GPS, GSM module, liDar.

I. INTRODUCTION

In the modern world automation is easy but the cost for automation is very difficult ,Here we introduce an Automatic vehicle for physically challenged person by the low cost of automation .The project is mainly designed for physically challenged person ,through this Algorithm they can travel to their willing places without anyone help. And mainly Without any accidents by self obeying traffic rules and signals .The destination place where the physically challenged people wish to reach is informed through their mobile phone ,when the destination place is informed through the mobile phone the car automatically go to the desired place by the use of Arduino and IOT .An Autonomous vehicle (sometimes referred as automated car or self- driving car) is a robotic vehicle that is designed to fulfilling the transportation capabilities without a human operator. Qualifying to it as fully autonomous, vehicle must be able to navigate without human input to the destination that is predetermined over unadapted roads and is capable to sense the environment.

II. RELATED WORK

The project is designed mainly for physically challenged person. when the destination place is informed via mobile phone or device inside the car the device converts speech to text and transfer the data to arduino via Bluetooth module(hc 06) .After receiving command from the Bluetooth module the GPS module extracts latitude and longitude data from the GPS module and the car starts moving to the destination place by avoiding obstacles on the road by HC SR04 ultrasonic sensor , to avoid the over cross of line on the road pololu QTR8RC sensor is used to reflect the white spaces on the road ,the car will automatically obey the traffic signals by the use of TCS 230 color sensor ,the compass module is used to get the poles direction which is used for moving the car to the desired latitude and longitude places .All the data's are transferred to WAMP server through GSM module such that anyone can access it from anywhere . Raspberry pi is used to make interface between live video streaming and the internet .The caretaker of physically challenged person can track their exact location via GPS module which is connected to WAMP server and RFID tags are used to avoid the damage while turning towards the road as it gives a alert to the car . Through the liDar sensor it sense the 3d mapping image of the road which is feed back to the arduino for the movement of the car .

III. LIDAR SENSOR

(Light Detection And Ranging also LADAR) is an optical remote sensing technology which is used to measure the distance of target with illumination to light in the form of pulsed laser. It is a laser range finder also known as “heart of system”, mounted on the top of the spoiler. A detailed #- D map of the environment is generated by the device VELODYNE 64- beam Laser (for autonomous ground vehicles and marine vessels, a sensor named HDL- 64E LIDAR is designed for obstacle detection and navigation. Its scanning distance is of 60 meters (~ 197 feet). For 3D mobile data collection and mapping application this sensor becomes ideal for most demanding perceptions due to its durability, very high data rates and 360 degree field of view. One piece design patented the HDL- 64E’s uses 64 mounted lasers that are fixed and each of it is mounted to a specific vertical angle mechanically with the entire spinning unit, to measure the environment surroundings. Reliability, field of view and point cloud density is dramatically increased by using this approach.)

High resolution maps of the world are combined by the car laser measurement to produce different types of data models that allows it to drive itself, avoiding obstacles and respecting traffic laws. A LIDAR instrument consists of a Laser, Scanner and a specialized GPS receiver, principally.

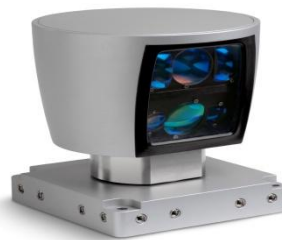
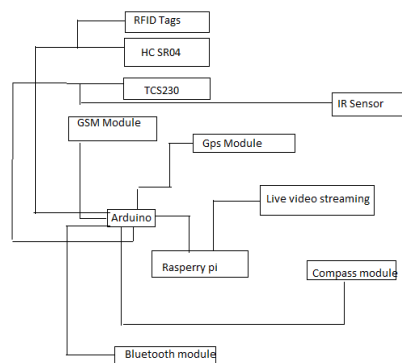


FIG shows the lidar sensor

BLOCK DIAGRAM



Interior Block Diagram

IV. EXPERIMENTAL RESULTS

Figures shows the results of obstacle detection from an Road and the car responding by GPS based liDar sensor. Figs. 2, 3, 4 (a) shows the 3d mapping image from liDar sensor. (b) is the image obtained by the liDar sensor. Figs.5,6 shows that the 2d image obtained by the HC SR04 sensor.

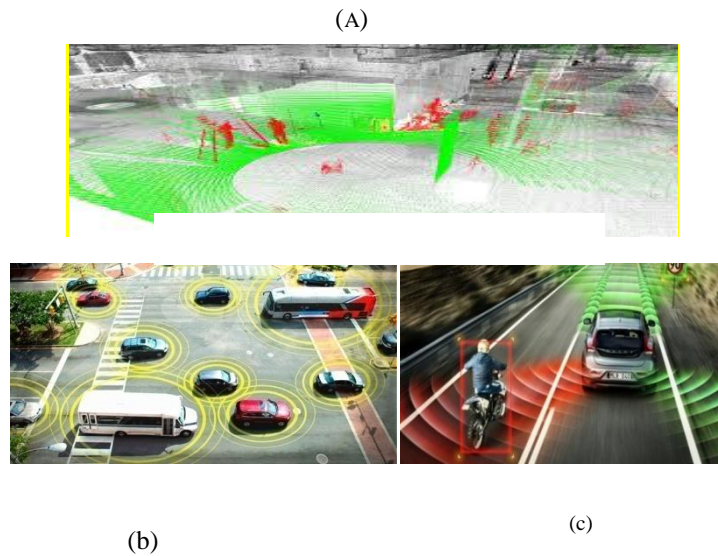


Fig. 3 Detection of 2d map using HC SR04

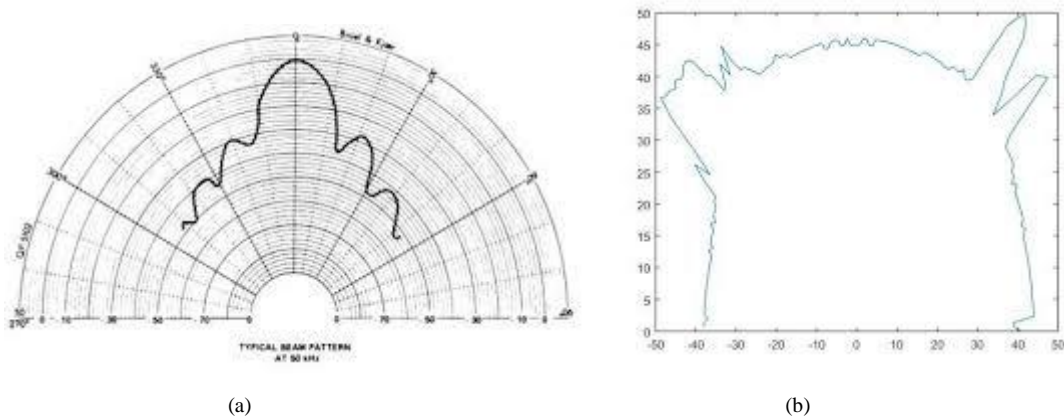


Fig. (b)Shows the accurate detection of obstacles over the road.

V. CONCLUSION

We have implemented an autonomous handicapped vehicles. Our algorithm successfully detects the Roads,peoples,and Obstacles on the Road. We have applied our algorithm on many images and found that it successfully detect the Obstacles and perform Self driving to our desired places.

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