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# The Driver-Less Car - The new Automation Technology for road safety

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## ABSTRACT

***Driverless technology is on the horizon once picturing degree automobile travelling down the road, one image that involves mind is that the driver at the hand wheel. Driver is key person in process of driving the vehicle. Slightest flaw can lead to a fatal disaster, which creates pressure on driver while driving the vehicle. Driverless cars are designed to operate safely and autonomously without any human intervention. Driverless-car don't have a steering wheel, accelerator or breaks because they won't need them, all work is done by software and sensors. Car will take you where you want to go just at the push of a button. Driverless technology steps towards improving road safety and give easy-nest in driving, also transform mobility for millions of people.***

***Keywords—Distance measuring sensors (Ultrasonic, Radar), Lidar, path mapping, navigate.***

## 1. INTRODUCTION

A Driverless automobile is a vehicle equipped with an associate autopilot system and capable of driving from one purpose to a different without aid from an operator. Most common cause of traffic accidents is because of driving errors and India contribute 6 % of the world's road death accidents. Cell phones within the car, diversion (entertainment) systems, more traffic and more sophisticated technology, the car can do the concentration for us.

Self-driving car is a vehicle which is capable of sensing its own surrounding, navigating and fulfilling the human transportation requirements without any human interruption. Driverless car is a big step in advancing the future technology. Paper presentation a unique embedded design of a driverless, destruction (collision) protected and GSM destination navigate the vehicle. Self-driving cars can detect their own moving environment using a variety of sensors such as radar, Lidar, Ultrasonic, Camera and GPS Module. GPS module can accurately and continuously track the location of the car, source and destination, and maps the coordinates which will provide navigation speed of the vehicle which is automatically managed by keeping a secure distance from other car by tracking speed of ahead vehicle. It also prevents collision due to an obstacle. Camera with image processing unit has been used to sense traffic lights and traffic density. Information also is provided to the passenger. Advance management system interprets sensory information to spot acceptable steering ways, as well as obstacles and relevant signage. Driverless cars have management systems that are capable of analyzing sensory information to distinguish between different cars moving on the road. This is very helpful in coming up with a path to the specified destination

## 2. LITRATURE SURVEY

Autonomous Driving will be the next big disruptive innovation in the years to come. Considered as being predominantly technology driven, it supposed to have a massive societal impact in all kinds of fields we studied each of these articles in detail & understood the way the need of driverless technology what are benefits of that Pons and cons about this technology. We read the different author book analyzed their opinion about this technology. However, after considering a plethora of scholarly articles, we conclude that the autonomous driving field started already a few decades ago. Leading to a huge analysis of some semi-automatons features, development of present technologies and understanding on the long run issues whereas focusing within the close to future in a very connected automobile. The future in a connected automobile according to research several

states in US have passed laws permitting autonomous cars testing on their roads the future is smart car commonly used by many people.

## 3. PROBLEM DEFINATION

An Autonomous vehicle is a robotic vehicle that is designed for fulfilling transportation capabilities without a human operator. Certifying to it as fully autonomous, a vehicle must navigate without human intervention to the destination that is proposed over updated roads and is capable to sense the environment information. The Report suggests that the majority of the crashes occurring once every roughly 3 million hours of driving as compared to India by a survey of shadier Cell phones in-car, entertainment system, more traffic and more complicated roads system making it more frequent. According to World Health Organization, road traffic injuries and deaths caused are estimated around 1.26 million worldwide in the year 2000.

### 3.1 Human Factor

Human Factor means vehicle collisions that take place because of drivers and road users which contribute to road accidents. Accidents occur because of driver's behavior such as lack of attention and lack of decision-making ability. According to statistics, 54% of majority traffic accidents are caused because of alcohol.

### 3.2 Vehicle Factor

A car without a driver in near future would be safer than car with driver. The speed of human reflex action is two hundred ms, and the computing power of latest computers can support traffic calculations up to ten ms. Autonomous car can calculate the shortest distance with respect to other cars for avoiding traffic jams or accidents.

## 4. PROPOSED SYSTEM

Here we propose a system in which a driver is never required to take control to safely operate the vehicle. This system arranges the sensors and software to drive, navigate, and control the vehicle. In driverless car the destination is set by "the driver" and software of car calculates the distance and proceeds on its way. These systems use a LIDAR sensor, which is mounted on the top of the car. The ultrasonic sensor measures the distance between the nearby cars. Continuous 360 degrees of visibility – Consider if your human eyes allowed you to see in all directions, instead of guessing, you could always know the precise distance of objects. If the distance of the car is too close to the obstacle system will automatically adjust the speed of the car downwards. The Radar is fixed on cars front and back side in such a way so it can detect obstacles from every angle. An Ultrasonic sensor which is present on the left rear wheel will monitor movements of the obstacle with respect to direction of the car. All the sensors are connected to a Raspberry pi3 which will get input from various sensors mounted on the car. Raspberry pi3 will create a virtual environment for the car by taking real time input from environment and based on the input it will manage actions such as acceleration, steering, and brakes which was handled by human drivers currently. Figure 1 shows the general placement of the sensors.

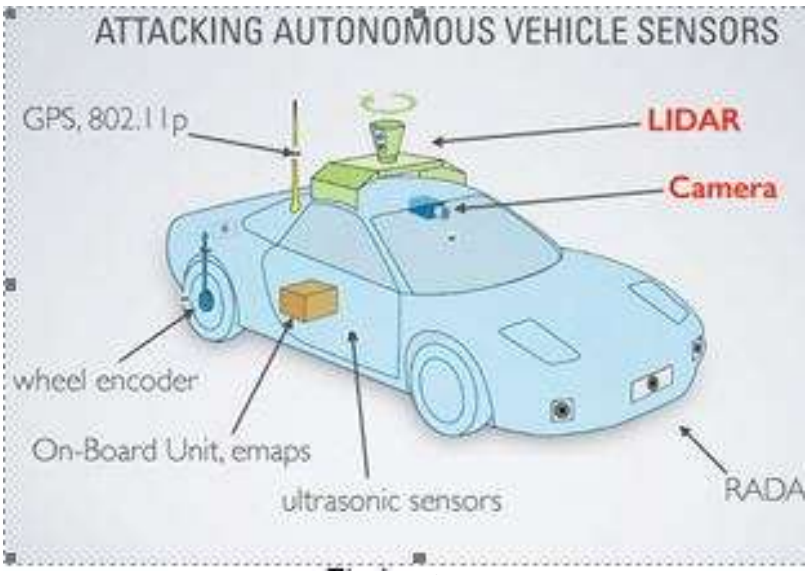


Fig.4: placement of the sensors

## 5. METHODOLOGY

The autonomous car reconsidered the following sensors essential: LIDAR, RADAR, GPS, proximity sensors and OPTICS. These sensors then pass the collected information to the processor for processing. Then the car adapts itself as per the data collected. In order for efficient working the car needs to map out a 3D model of the surroundings. The rate of creation of this model needs to be quick as possible as while driving on road cars tends to drive at quite the speed. Also, the placement of sensors is essential. If the placement of sensors is not proper then it may lead to creation of dead spot around the car which can turn to be quite dangerous.

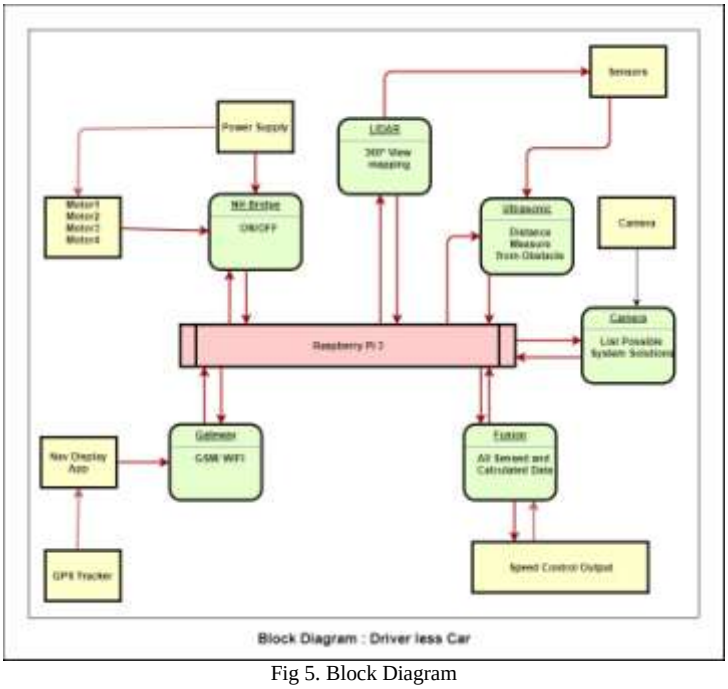


Fig 5. Block Diagram

### 5.1 Lidar

Light detection and ranging sensor is remote sensing technology which is used to measure the distance of obstacles with the help of light which is in the form of laser. It is range finder which is known as "heart of system" that is present on top of spoiler. It works to get a detailed map of surrounding by shooting laser beams in all direction and receiving it back. Its range to scan distance is of 60 meters. For automatic car this sensor becomes ideal because of its high data rates and ability to scan 360 degree.

### 5.2 Radar

Its main task is to see how far a car is in the direction it is pointed. Generally, this sensor is mounted in the four directions to get the distance between the cars in the four directions.

### 5.3 Gps

Global position system is used to basically know its current location.

### 5.4 Ultrasonic sensor

Ultrasonic sensor are a type of acoustic sensor ultrasonic transducers are used in system which evaluate target by interpreting the reflected signals it can detect the movement of targets and measure the distance to them in several machine-controlled factories and method pants

### 5.5 Central processing unit (raspberry pi)

Raspberry Pi is credit card sized ARM based SBC (Single Board computer). It runs GUN/Linux operating system Raspbian based on Debian and the SBC consist of ports for many other OSes.Raspberry pi3 B provides on-board Wi-Fi / Bluetooth support and a 64-bit improved Processor. In this system Raspberry pi work as central processing unit. All information from all of the sensors is analyzed by the central processing unit that manipulated the steering accelerator and breaks its software must understand the rules of the road both formal and informal.

### 5.6 L298nh bridge

L298 is a bidirectional motor driver which is based on dual H-Bridge Motor driver IC. This bridge allows you to control two motors independent of each other in any one direction. It controls a set of two DC motors simultaneously in any one direction. It means that we can manage two set of DC motors with a single motor controller. The L298N Bridge receives signal from the Raspberry Pi3 and transmits it to the motors. It has two voltage pins, of which one is used to draw current for the L298N and the second is used to apply voltage to the motors. The L298N manages its output signal according to the input signal received from the microprocessor.

## 6. PRIMARY OBJECTIVES

A. ***Increase In Safety:*** *All over the world, 1.2 million peoples die every year in road accidents. These widespread have promoted the development of self-driving vehicles. Driverless car could eliminate 90% of all accidents in the world, preventing up to $190 billion damage and health costs annually and saving thousands of lives.*

B. ***Better Transportation Service:*** *The future of driverless cars is likely to include sharing schemes. Self-driving cars incorporated into car-sharing services like Zip car could affordably transform cars from a thing people own to a service they call up on demand.*

C. ***Less Traffic:*** *Driverless vehicles can communicate with each other and also with their surroundings; hence they are able to identify the optimal route. This helps to spread demand for scarce road space.*

D. ***Reduced-Emission:*** *Global CO2 emission from transport vehicles have grown by approximately 45% from 1990 to 2018. The use of autonomous taxis alone can reduce the greenhouse gas emissions by 87 to 94% per mile by the years 2030.*

E. ***Better health:*** *Less traffic on roads will help to improve people's health since traffic jams are the reason which has shown a rise in blood pressure, depression and anxiety among people, as well as a decrease in cardiovascular fitness and quality sleep.*

## 7. CONCLUSION

According to World Health Organization, more than millions of lives are lost each year in road accidents. The aim of driverless car is to provide safety. In today's youth the main cause of death is because of road accidents. It is a fact that we believe our technology has the potential to cut the number, perhaps by as much as half. We're confident that self-driving cars will improve vehicle's stability. Driverless cars are designed to decrease accidents by addressing main causes of accidents such as driving error by driver, distraction, and unconsciousness.

While this project is more on the experimental stage, it provides a glimpse of what transportation may look like in near future.

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