

A study on Future of Driverless Cars

Yojna Arora

Ass. Professor Department of Computer Science and Engineering, Amity University, Haryana

Abstract: Driverless cars (sometimes called self-driving cars, self-driving cars or self-driving cars) are robotic cars whose purpose is to travel between destinations without the need for an operator. In order to meet fully autonomous requirements, the vehicle must be able to navigate to a pre-determined destination on the road that has not yet been adapted for use without human intervention. Since the 1920s, autopilot has been experimented and made promising tests in the 1950s.

Keywords: Self-driving, Automated

I. Introduction

Whether it is a small ball, a herd of cows or an old car, accidental obstacles are fatal to the driver. But scientists say that future cars may foresee this danger. Companies that develop and/or test driverless cars include Audi, BMW, Ford, Google, General Motors, Volkswagen and Volvo. Google's test involves a group of self-driving cars - six Toyota Prius and one Audi TT - driving over 140,000 miles of California streets and highways. Supporters of systems based on driverless cars say they will eliminate accidents caused by driver errors, which is the cause of almost all current traffic accidents. In addition, the higher accuracy of automated systems can improve traffic flow, significantly increase road capacity and reduce or eliminate traffic congestion. Finally, these systems will allow passengers to do other things while traveling, such as work, reading or sleeping. Future AVs will have no steering wheel or pedal and will come in all shapes and sizes; pods that can carry six or eight people may prove to be the most effective designs. These pods will initially operate in urban areas with limited geographical location and well-drawn areas.



Figure 1: A driver less car created in the early 1970s.

1.1 TECHNIQUES AND TECHNOLOGIES USED

The first part is perception, which collects data about the environment. You have different types of sensors. The main type of sensor used in today's automated driving is LIDAR. One of the main problems with laser radar is cost. However, some start-up companies are studying low-cost LIDAR systems. Then of course there is GPS, there is also a sensor called Inertial Measurement Unit (IMU). Today's people often combine data from GPS, IMU, and Lidar to locate the vehicle to centimeter accuracy. There is also a sensor - radar - used to avoid obstacles. This is a reaction mechanism. If none of the above sensors can recognize the front object, then this sensor can detect objects 5 to 10 meters away from you. This radar is directly connected to the control system so that when it detects an object in front of you, it can automatically drive the car away from the object.

1.2 WORKING OF AUTONOMOUS CARS

"Driver" sets the destination. The car's software calculates a route and starts the car. A rotating roof mounted laser radar (Light Detection and Ranging) monitors the distance of 60 meters around the car and creates a dynamic 3D map. The sensors on the left rear wheel monitor the lateral movement to detect the position of the car relative to the 3-D map. The radar system in the front and rear bumpers calculates the distance to the obstacle. The artificial intelligence (AI) software car is connected to all sensors and has inputs from Google Street View and an in-car video camera. The AI simulates human perception and decision-making processes and controls the driver's behavior in the control system, such as steering and braking. The car's software consulting Google Maps can notify landmarks, traffic signs and lights in advance. Provides an override feature that allows personnel to control the vehicle.



Figure 2: Techniques used

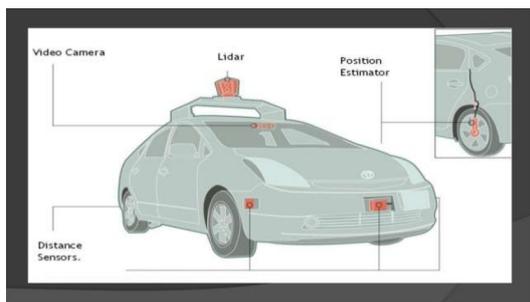


Figure 3: Various techniques used



Figure 4: A prototype of future driver-less car

1.3 ADVANTAGES OF DRIVERLESS CARS

- More free time

Without a driver, the car can become a mini lounge. There will be more space, and not everyone needs to face forward. Entertainment technologies such as video screens can be used to ease long-distance journeys without fear of driver distraction.

- Reducing accidents means more safety

More than 80% of accidents in the United States are caused by driver errors. If all vehicles are driverless, there will be no bad riders and fewer mistakes on the road. Drivers drunk driving will also be the past. Traffic in urban areas can be more easily coordinated to prevent long periods of tailing during busy periods. Commuting time may be greatly reduced.

- Good for people with disabilities

People who have experienced difficulties in driving in history, such as disabled people and the elderly, and young people, can experience the freedom of car travel. No driving license or driving test required

- Better transportation

The future of driverless cars will include shared systems, and efficient travel also means saving fuel and reducing costs.

- Efficient parking

Parked vehicles and difficult operation will relieve stress and do not require special skills. This car can even get you off and stop yourself

1.4 CHALLENGES TO OVERCOME

• Pricing: No matter how incredible the innovation is, if the price is not cheap, it is useless. So pricing is a big problem.

• Consumers understand that even if the driverless car is affordable, if they do not know it, no one will buy it. This means that self-driving car companies need to promote the advantages of self-driving cars to consumers.

• Need Internet: If we need a driverless car to succeed, then it is important to have a perfect internet connection



Figure 5: Google's first working driver-less car



Figure 6: This picture shows how a future driver-less car would look with a lot of space and entertainment facilities.

II. Conclusion

Whether it is a small ball, a herd of cows or an old car, accidental obstacles are fatal to the driver. But scientists say that future cars will be able to anticipate this danger. Although the direct impact of the widespread use of self-driving cars is the loss of jobs related to driving in the road transport industry. But just as we all know that humans take change, there are many solutions to this problem.

In general, this project will be a fierce and revolutionary change for humans, although more research, testing and research are needed to achieve a higher level of maturity for driving-free cars and to realize their full potential.

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