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GOOGLE SELF-DRIVING CAR

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Abstract
There was done a study of Google corp. driverless car project, which can turn drivers into passengers and help to improve safety on the roads.
Keywords: self-driving, lidar, sensors, Google maps, artificial intelligence, software development.

Introduction

Google company is working toward the goal of vehicles that can shoulder the entire burden of driving. They are developing a car that can take human where he wants to go at the push of a button. The main idea of whole project is not to push Google into automobile building business. Instead, the company wants to develop self-driving software that will improve road safety and will help people who can not drive.

Study results

Project of driverless car was established and currently being led by Sebastian Thrun who is director of the Artificial Intelligence Laboratory and co-inventor of Google Street View.

Google self-driving car can steer itself while looking out for obstacles, it can accelerate itself to the correct speed limit and it can stop and go itself based on any traffic conditions. This car is a combination of different technologies developed by Google Corporation. The car uses Google maps, external sensors to collect data about current environment conditions and artificial intelligence to make decisions about directions, car speed, etc.

Google map interacts with GPS and acts like a database supplying the car with necessary traffic information. It warns car about speed limits, upcoming intersections, nearby collisions, directions etc. But this data is permanent and environment around the car changes every moment, so that is why hardware sensors needed.

Environment is dynamic so the car needs real time results. The hardware sensors give real time environment properties and sensors attempt to create observable environment. Hardware sensors include lidar, video camera, position estimator and distance sensor (Fig. 1).
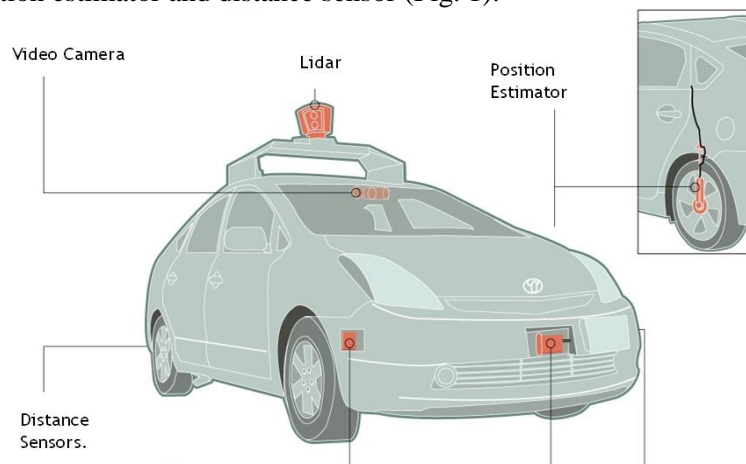

Figure 1 – Sensors on the driverless car

Lidar is an optical remote sensing technology that measures the distance to, or other properties of a target. It can scan distance up to 60 meters.

Video camera is inbuilt in rear view mirror and it detects upcoming traffic lights, signs etc. It also serves for recognizing moving obstacles like pedestrians and vehicles.

Position estimator determines vehicle's location and keeps track of its movements.

Google maps and hardware sensors send information to artificial intelligence control unit. AI then determines how fast to accelerate, when to slow down or stop, when to steer the wheel etc.

Truly self-driving cars could cost $7,000 to $10,000 more than their manual counterparts when they hit the market. In addition, they probably will be available only as luxury models to start.

As a result, we have a car with improved fuel efficiency, higher speed limit for autonomous cars, fewer traffic collisions, reduction of space required for vehicle parking and a great help for people who are physically challenged. The only significant disadvantage of this project – it needs well developed Google Maps system and roads in good condition which both are issues for Ukraine today and that is why we will not be able to see such cars on Ukrainian roads in the nearest future.

Conclusions

These cars will be very useful because they will help to avoid accidents on the roads, they will reduce the traffic time at traffic signals, it means transportation for potentially billions of people who are unable to drive because of age, disability or income.

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