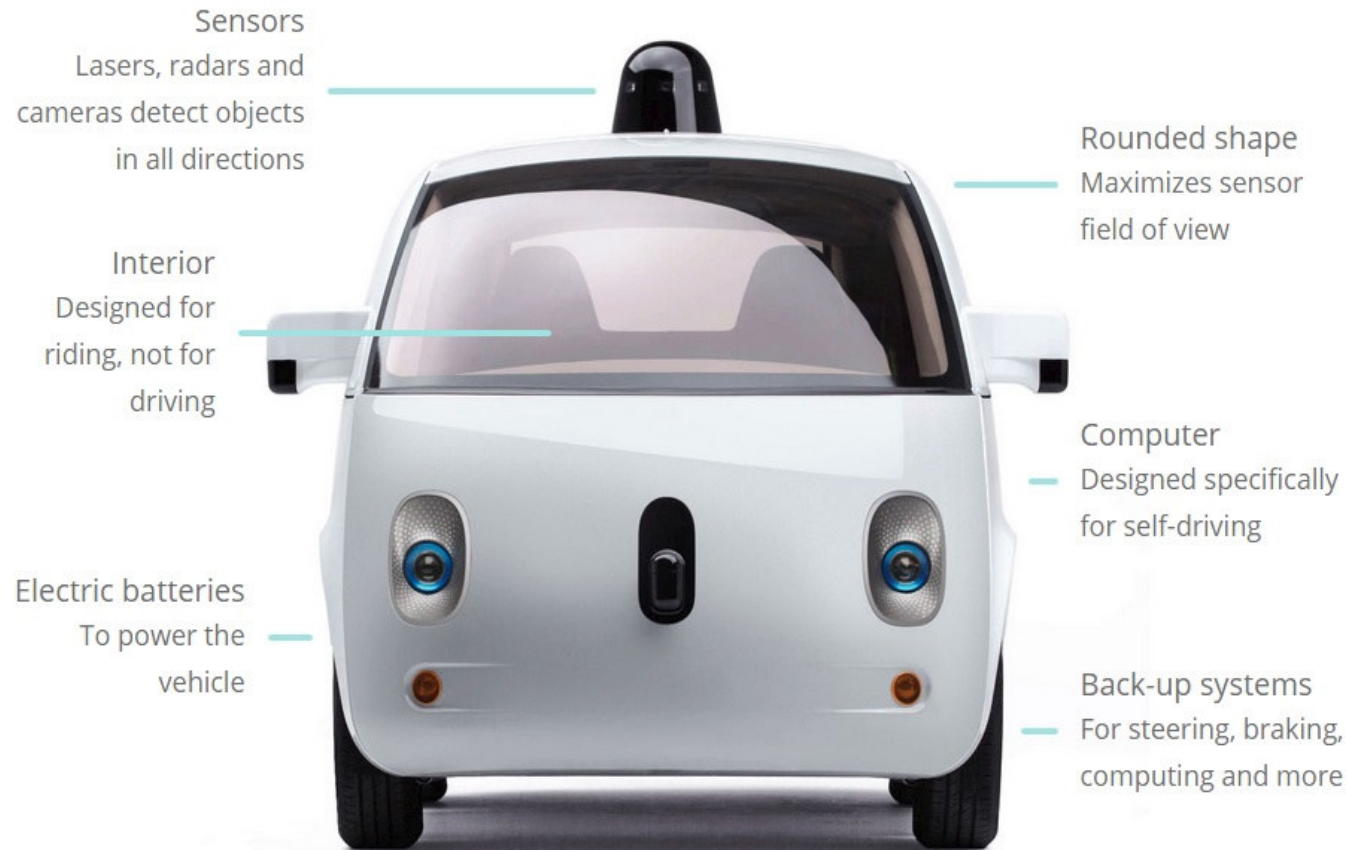


GOOGLE DRIVERLESS CAR



Hakan Can İpek

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CONTENT :

- Introduction.
- History.
- Components
- Action.
- Conclusion.



INTRODUCTION:

The Google Driverless Car is like any car, but:

- It can steer itself while looking out for obstacles.
- It can accelerate itself to the correct speed limit.
- It can stop and go itself based on any traffic condition.

It can take its passengers anywhere it wants to go safely, legally, and comfortably.



HISTORY:

The project is currently being led by: Sebastian Thrun



- Director of the Stanford Artificial Intelligence Laboratory
- 2005 DARPA Grand Challenge Winner (The DARPA Grand Challenge is a prize competition for American autonomous vehicles, funded by the Defense Advanced Research Projects Agency)
- Co-inventor of Google Street View

Google Driverless Car



COMPONENTS

Integrates Google Maps with various hardware sensors and artificial intelligence software

➤ Google Maps

Provides the car with road information

➤ Hardware Sensors

Provides the car with real time environment conditions

➤ Artificial Intelligence

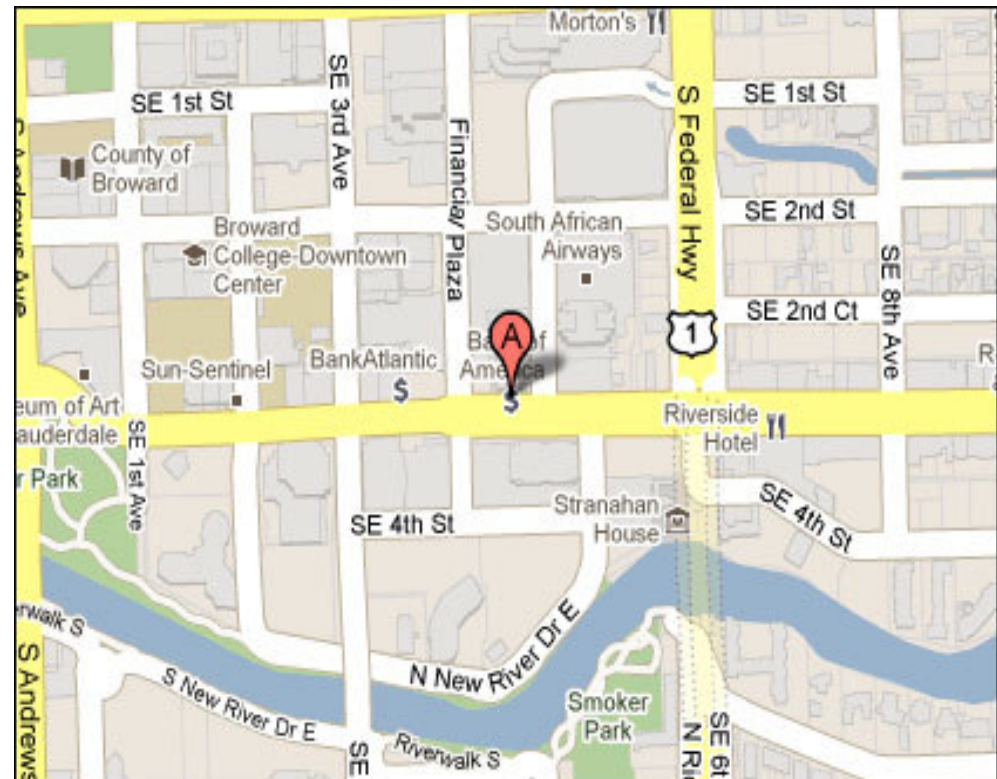
Provides the car with real time decisions



GOOGLE MAP:

Google Maps interacts with GPS and acts like a database.

- Speed Limits.
- Upcoming intersections.
- Traffic Report.
- Nearby collisions.
- Directions.



Google Driverless Car



HARDWARE SENSORS:

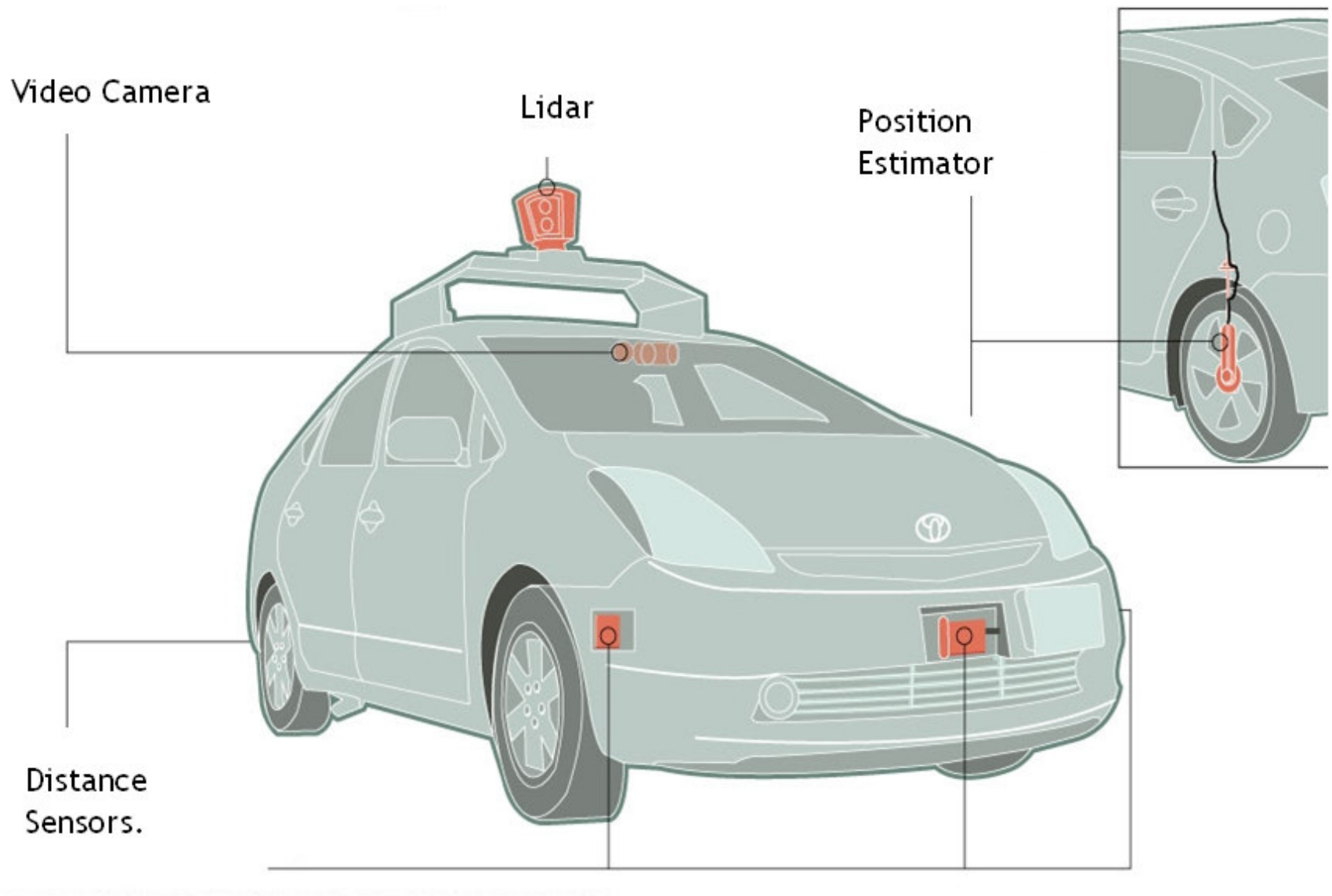
- The hardware sensors gives real time environmental properties.
- Environment is dynamic so need real time results.
- Sensors attempt to create fully observable environment.



HARDWARE SENSORS:

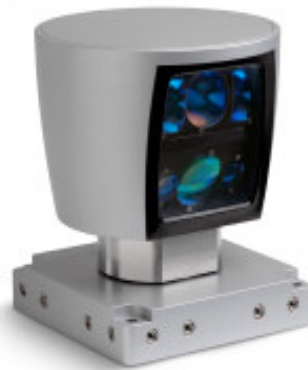
- LIDAR
- VIDEO CAMERA
- POSITION ESTIMATOR
- DISTANCE SENSOR





LIDAR

- “Heart of our system”
- LIDAR (Light Detection And Ranging, also LADAR) is an optical remote sensing technology that can measure the distance to, or other properties of a target by illuminating the target with light, often using pulses from a laser.
- Scanning distance of 60 meters (~197 feet)



Google Driverless Car



➤ VIDEO CAMERA

Detects upcoming traffic light.

➤ DISTANCE SENSOR

Allow the car to "see" far enough to detect nearby or upcoming cars or obstacles

➤ POSITION ESTIMATOR(Wheel Encoder)

Determines vehicle's location and keeps track of its movements.



ARTIFICIAL INTELLIGENCE:

Google Maps and the hardware sensors data are sent to the AI.

AI then determines:

- how fast to accelerate
- when to slow down/stop
- when to steer the wheel

Goal of AI

The agent's goal is to take the passenger to its desired destination safely and legally



LET'S SEE IT IN ACTION!

A look from the inside...



A look from the outside...



Google Driverless Car



Advantages

- Avoid accidents
- Current location can be easily identified by GPS
- Manage traffic Flow.
- Increasing Roadway capacity.

Disadvantages

- If the user is using internet with less security then it can be caught by the hackers.
- Hackers can turn system on or off.
- Hackers can change the route.
- In case of failure in main sensor and backup sensor the vehicle can create chances of accidents.

Currently

As of 2012:

- Nevada
 - 1st state to allow driverless vehicles can be legally operated on public roads
- 6 Google Driverless Cars
 - 5 Toyota Prius
 - 1 Audi TT
- Total miles
 - 140,000 miles with occasional human intervention



Google Driverless Car



Conclusion:

- The driverless car improves vehicle's stability helps to minimize the loss of control.
- Main aim is to minimize the road accidents.



THANK YOU...