A Study on Google Driverless Car

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ABSTRACT: Over the past fifteen years, Google's rapid growth and subsequent dominance in the technology and information sectors has financially allowed Google to pursue seemingly unrelated ventures ranging from Google Mail to Google Car. In particular, Google has invested considerable resources in Google Car, an automated device that enables a vehicle to run without driver.

Although initial reports suggest that the driverless Google Car would be safer and more powerful than current cars, the Google Car is not without its critics.

The existential challenge posed by the automobile to many large industries, including the insurance, healthcare and construction industries, Creates a further obstacle to Google Car 's success far beyond the normal competitive challenges faced by other existing car manufacturers in the automotive industry, which poses the question, Will the Google Car be successful?

With so many obstacles above and above the competitive forces that usually threaten long- term competitiveness, the Google Car would be able to build and maintain Google's competitive edge in driverless car space remains an unanswered question to date.

KEYWORDS

LIDAR, Ultrasonic sensor,

1. INTRODUCTION

The automobiles in the modern age are based on automation to offer comfortable driving to the human driver. Different aspects have been considered in the automotive field which makes a vehicle automated. Google, the largest network of self-driving cars, has started working since 2010 and is still developing new changes to give automated vehicles a whole new level.

2. Architecture

Architecture diagram is a representation of various concepts involved in a product. It defines the relationship between various concepts, how it works, the communication lines etc.

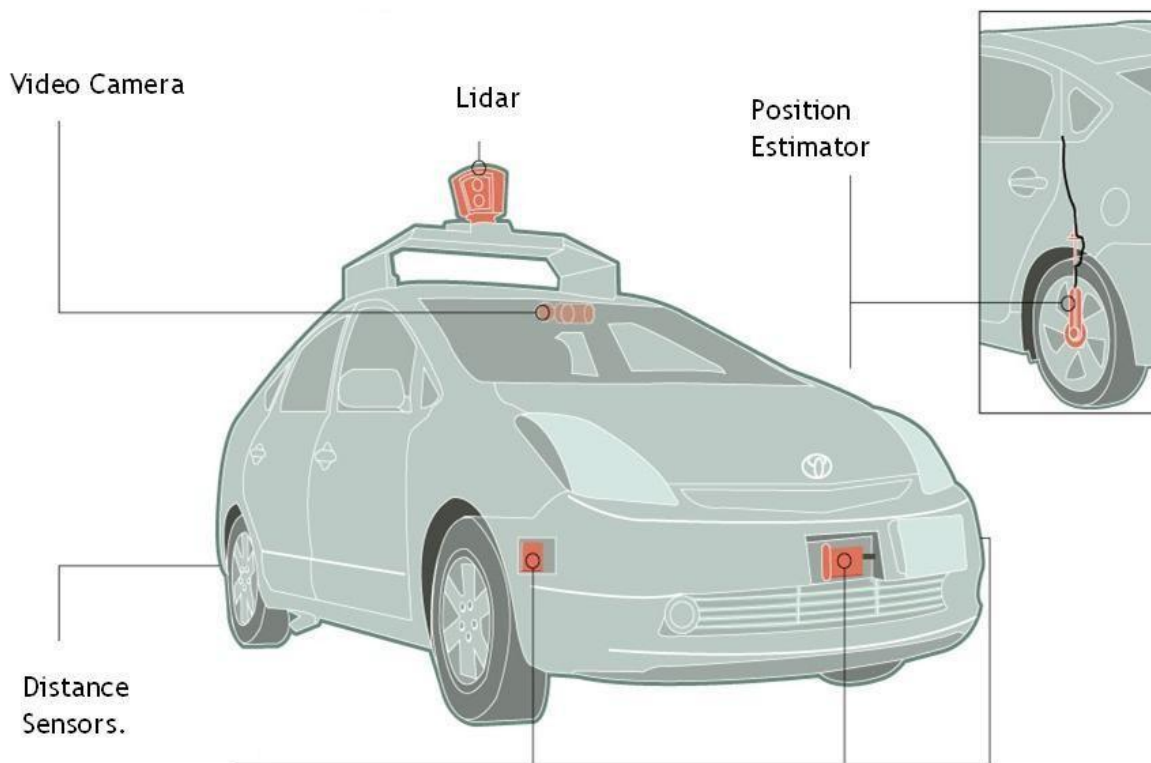The below Figure shows the architecture of the google driverless car indicating components used as well.

Fig. Google Driver less Car

3. Advantages

There are many advantages with Google driver less car

Reduced accident rate

As google driverless car involves less human intervention and thus making it less prone to errors and reduces the accident rate by considerable amount.

The study about the reliability shows that it is much more reliable than human driving.

Improved Efficiency

As the vehicle is driven it adjusts the gears, acceleration and brake only when required and improves fuel efficiency. The vehicle reaches its top speed on a free road without havinto spend much fuel.

LIDAR usage

The Usage of LIDAR helps the vehicle to know its surrounding better by creating a cloud point which is a map which shows objects as points. This can be converted to any other kind of map and can be incorporated with google maps database and get live updates on traffic or any other routes unknown to a general human.

Reduced manual work

As human intervention is not required due to the involvement of LIDAR, RADAR, video camera and AI very less effort is required .

The Vehicle can automatically open doors and make the manual work to 0%.

3. Drawbacks

There are certain inherent drawbacks that the driverless car comes with:

AI is Hackable:

The AI used is a software an every software has its on threats. These software threats can be exploited by criminals which puts the humans life inside the vehicle at risk. As AI controls acceleration and brakes as well this threat is a major drawback.

Loss of Jobs

The taxi industry is prominent today and introduction of driverless vehicles put taxi drivers job at risk.Many drivers will be left unemployed and thus increase in unemployment will be seen.

4. The Future of Driverless

The driverless cars still have lot of work to be done on them.

- The AI can be developed to improve reliability

- New software should be developed which increase security and make the car foolproof.

- Development of components in bulk to reduce effective cost of the vehicle

- Improve mobility on not so good roads.

5. CONCLUSION

In conclusion, Autonomous cars require billions of miles of road tests across a vast number of driving conditions to ensure consumer safety, which cannot be accomplished in our lifetime with physical testing alone. Simulation greatly reduces the need for physical road tests and is the only way engineers can more quickly test thousands of AV travel scenarios, maximise the performance of sensors and perception algorithms and ensure safety.

6. REFERENCES

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