

# DRAWBACKS AND CONFRONTATIONS OF NEW SMART DRIVER LESS VEHICLE CREATED BY TESLA AND GOOGLE

<sup>1</sup> Krithikaa Venket.V.S, <sup>2</sup> Sainath Kishore.R.G, <sup>3</sup> Alaghusooriya.E.M, <sup>4</sup> A.Amrita

<sup>1</sup> Assistant professor of Information Technology, SNS College of Technology,

<sup>2</sup> Department of Information Technology, SNS College of Technology

<sup>3</sup> Department of Electronics and Communication Engineering, SNS College of Technology

<sup>4</sup> Department of Electronics and Communication Engineering, SNS College of Technology

<sup>1,2,3,4</sup> Coimbatore-35, India.

<sup>1</sup>krithivenket07@gmail.com, <sup>2</sup>sainathkishorerajagopal@gmail.com, <sup>3</sup>aalaghusooriya@gmail.com, <sup>4</sup>amritaee1996@gmail.com

**Abstract—** During May 2014, Google presented a new concept for their driverless car that had neither a steering wheel nor pedals, and unveiled a fully functioning prototype in December of that year that they planned to test on San Francisco Bay Area roads beginning in 2015. Google plans to make these cars available to the public in 2020. New smart driver less vehicle created by tesla and Google has been introduced for the improvement of automobiles. This can be considered to be a boon but it has its disadvantages too. Implementation of IT fields in the automobiles can be used to increase the efficiency of the vehicles and technology development done by them. But still its negativities has to be dealt with for the proper exposure of this technology in the future.

**Keyword —** Google tesla smart cars IT.

## I. INTRODUCTION

### I. GOOGLE SELF DRIVING CAR

A Lexus RX450h retrofitted by Google for its driverless car fleet Public road testing of driverless cars is legal in California, Michigan, Florida, Nevada, Arizona, North Dakota, Tennessee, the District of Columbia, and Utah. (Updated 23 Mar 2016) Google self-driving cars are any in a range of autonomous cars, developed by Google X as part of its project to develop technology for mainly electric cars. Lettering on the side of each car identifies it as a "self-driving car". The project was formerly led by Sebastian Thrun, former director of the Stanford Artificial Intelligence Laboratory and co-inventor of Google Street View.

In April 2012, Florida became the second state to allow the testing of autonomous cars on public roads, and California became the third when Governor Jerry Brown signed the bill into law at Google Headquarters in Mountain View. In December 2013, Michigan became the fourth state to allow testing of driverless cars on public roads. In July 2014, the city of Coeur d'Alene, Idaho adopted a robotics ordinance that includes provisions to allow for self-driving cars.

## II. TESLA MOTORS

Tesla Motors Inc. suspects the automatic braking system on a Model S car involved in a fatal crash either didn't detect the truck it struck, or saw the vehicle and failed to act, company representatives are said to have told congressional aides probing the accident.

The braking system's radar and camera may have failed to detect the tractor-trailer, Tesla representatives said during a July 28 briefing to Senate Commerce Committee staff members looking into the crash, said a committee official familiar with the discussion.

Alternatively, the braking system's radar may have detected the trailer but discounted it as part of a design to disregard overhead structures such as bridges and highway signs to avoid improperly applying the brakes, Tesla representatives said, according to the person who spoke on condition of anonymity because the briefing wasn't public.

The white tractor-trailer turned in front of the car against a brightly lit sky on May 7 near Williston, Florida, according to the carmaker.

Members of Congress including Senate Commerce Chairman John Thune, a South Dakota Republican, and U.S. safety officials have heightened scrutiny of Tesla's automated driving systems since the crash, which killed an Ohio man. The driver was using automated driving technology and was speeding when his 2015 Tesla failed to react to an 18-wheeler crossing the road, the National Transportation Safety Board said.

Tesla has said the crash was the first known fatality in more than 130 million miles of so-called Autopilot features, which are available on more than 70,000 vehicles worldwide.

Company representatives view the braking failure as separate from the Autopilot function that manages steering, changing lanes and adjusting travel speed, the committee official said.

Khobi Brooklyn, a Tesla spokeswoman, confirmed that the Senate briefing occurred but didn't provide further comments.

### III. TECHNOLOGY

The project team has equipped a number of different types of cars with the self-driving equipment, including the Toyota Prius, Audi TT, and Lexus RX450h, Google has also developed their own custom vehicle, which is assembled by Roush Enterprises and uses equipment from Bosch, ZF Lenksysteme, LG, and Continental. Google's robotic cars have about \$150,000 in equipment including a \$70,000 LIDAR system. The range finder mounted on the top is a Velodyne 64-beam laser. This laser allows the vehicle to generate a detailed 3D map of its environment. The car then takes these generated maps and combines them with high-resolution maps of the world, producing different types of data models that allow it to drive itself. As of June 2014, the system works with a very high definition inchprecision map of the area the vehicle is expected to use, including how high the traffic lights are; in addition to on-board systems, some computation is performed on remote computer farms.

### IV. ROAD TESTING

As of June 2016, Google had test driven their fleet of vehicles, in autonomous mode, a total of 1,725,911 mi (2,777,585 km). A Toyota Prius modified to operate as a Google driverless car, navigating a test course. In 2012, the test group of vehicles included six Toyota Prius, an Audi TT, and three Lexus RX450h, each accompanied in the driver's seat by one of a dozen drivers with unblemished driving records and in the passenger seat by one of Google's engineers. By May 2015, that fleet consisted solely of 23 Lexus SUVs.

Google's vehicles have traversed San Francisco's Lombard Street, famed for its steep hairpin turns, and through city traffic. The vehicles have driven over the Golden Gate Bridge and around Lake Tahoe. The system drives at the speed limit it has stored on its maps and maintains its distance from other vehicles using its system of sensors. The system provides an override that allows a human driver to take control of the car by stepping on the brake or turning the wheel, similar to cruise control systems already found in many cars today.

On March 28, 2012, Google posted a YouTube video showing Steve Mahan, a resident of Morgan Hill, California, being taken on a ride in Google's self driving.

Toyota Prius. In the video, Mahan states "Ninety-five percent of my vision is gone, I'm well past legally blind". In the description of the YouTube video, it is noted that the carefully programmed route takes him from his home to a drive-through restaurant, then to the dry cleaning shop, and finally back home.

In August 2012, the team announced that they have completed over 300,000 autonomous-driving miles (500,000 km) accident-free, typically have about a dozen cars on the road at any given time, and are starting to test them with

single drivers instead of in pairs. Four U.S. states have passed laws permitting autonomous cars as of December 2013: Nevada, Florida, California, and Michigan. A law proposed in Texas would establish criteria for allowing "autonomous motor vehicles".

In April 2014, the team announced that their vehicles have now logged nearly 700,000 autonomous miles (1.1 million km). In late May, Google revealed a new prototype of its driverless car, which had no steering wheel, gas pedal, or brake pedal, being 100% autonomous. In June 2015, the team announced that their vehicles have now driven over 1,000,000 mi (1,600,000 km), stating that this was "the equivalent of 75 years of typical U.S. adult driving", and that in the process they had encountered 200,000 stop signs, 600,000 traffic lights, and 180 million other vehicles. Google also announced its prototype vehicles were being road tested in Mountain View, California. During testing, the prototypes' speed will not exceed 25 mph (40 km/h) and will have safety drivers aboard the entire time. As a consequence, one of the vehicles was stopped by police for impeding traffic flow. Google has expanded its road- testing to the state of Texas, where regulations do not prohibit cars without pedals and a steering wheel. Bills were introduced by interested parties to similarly change the legislation in California.

Google expected the California Department of Motor vehicles to release precedent-setting regulations regarding driverless cars in January 2015, allowing the company to give public access to the prototypes.

However, as of November 2015, the DMV still has not done so. Google - and other companies - are not ready to share trade-secret safety data, although they continue to push for the publication of California regulations.

### V. CRASHES

On February 14, 2016 a Google self-driving car attempted to avoid sandbags blocking its path. During the manoeuvre it struck a bus. Google addressed the crash, saying "In this case, we clearly bear some responsibility, because if our car hadn't moved there wouldn't have been a collision." Some incomplete video footage of the crash is available. Google characterized the crash as a misunderstanding and a learning experience. The company also stated "This type of misunderstanding happens between human drivers on the road every day." As of July 2015, Google's 23 self-driving cars have been involved in 14 minor collisions on public roads, but Google maintains that, in all cases other than the February 2016 incident, the vehicle itself was not at fault because the cars were either being manually driven or the driver of another vehicle was at fault. In July 2015, three Google employees suffered minor injuries when the self-driving car they were riding in was rear-ended by a car whose driver failed to brake at a traffic light. This was the first time that a self-driving car collision resulted in injuries. Additionally, Google maintains monthly reports that include any traffic incidents that their self-driving cars have been involved in. Google is required by the Californian DMV

to report the number of incidents during testing where the human driver took control. Some of these incidents are not reported by Google when simulations indicate the car should have coped on its own. There is some controversy concerning this distinction between driver-initiated disengagements that Google reports and those that it does not report.

## VI. LIMITATIONS OF EXISTING SYSTEM

As of August 28, 2014, according to Computer World Google's self-driving cars were in fact unable to use about 99% of US roads. As of the same date, the latest prototype had not been tested in heavy rain or snow due to safety concerns. Because the cars rely primarily on pre-programmed route data, they do not obey temporary traffic lights and, in some situations, revert to a slower "extra cautious" mode in complex unmapped intersections. The vehicle has difficulty identifying when objects, such as trash and light debris, are harmless, causing the vehicle to veer unnecessarily. Additionally, the lidar technology cannot spot some potholes or discern when humans, such as a police officer, are signaling the car to stop. If the vehicle is using internet which is having less security from the hackers point of view in some cases the vehicle can be switched off on the road (in rare cases). Hackers can change the route which is plotted in the system (in rare cases). In case of failure of main sensor and backup sensors the vehicle can create a chance of accident. During night travelling, the efficiency of the light will be reduced due to some technical problem, hence camera detection has chances of failure.

## VII. SUGGESTIONS

Offline navigations can be used to reduce the hacking. Auto detecting sensing system is separately provided for checking whether the other sensors conditions and tells the updates to the user for each 5 minutes interval. In case of the auto-detection mode is failed at any circumstances, it must to

indicate the user that the system converted from automatic to manual mode. If the auto-detection is working perfectly and some sensor gets failed the system then the auto-detection mode should indicate the system, where it gets failed and what kind of problems that occurs and to indicate the user that the system is getting failed and the system that changes to manual mode from automatic mode. This helps in reducing the accidents that occurs during some technical fault occurs.

## CONCLUSION

In 2006, after dwindling sales and heavy financial losses, Smart GmbH was liquidated and its operations were absorbed by DaimlerChrysler directly. Smart now operates under the Mercedes-Benz Cars division of Daimler AG, offering solely the Fortwo Coupe and Cabrio models. Thus this will be a better technology if its drawbacks are all sorted out. Hence this can help the future generation in a lot of ways.

## ACKNOWLEDGMENT

I would like to thank MS. Krithikaa Venket.V.S Assistant professor of Information Technology SNS College of Technology for her efficient guidance for this paper.

## REFERENCES

- [1] Boulton, Clint. "Nissan Lays Out Roadmap for Autonomous Cars." The Wall Street Journal Blog. July 2014. Online. <http://blogs.wsj.com/cio/2014/07/17/nissan-lays-out-road-map-for-autonomouscars/>.
- [2] Wikipedia. Parking Assist System. 2014. Online. [http://en.wikipedia.org/wiki/Intelligent\\_Parking\\_Assist\\_System](http://en.wikipedia.org/wiki/Intelligent_Parking_Assist_System).
- [3] Wikipedia. Automatic Parking. 2014. Online. [http://en.wikipedia.org/wiki/Automatic\\_parking](http://en.wikipedia.org/wiki/Automatic_parking).
- [4] Tesla Motors Team. Tesla Blog. October 2014. Online. <http://www.teslamotors.com/blog/dual-motor-model-s-and-autopilot>.