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GOOGLE CHAUFFEUR – ABATING HUMAN ERRORS

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Abstract: Many cases of accidents and driver misleading the traveller have been reported. They have become very common these days. Science and technology have always tried to make human life easier. So the main purpose of this paper is based on abating the human errors by the invention of Google's Driverless Cars. It includes a LIDAR (laser radar) system. There is a Velodyne 64-beam laser mounted on the top. a detailed 3D map of its environment is generated by using the laser. These generated maps are then combined with high-resolution maps of the world; producing different types of data models that allow it to drive itself. Google's driverless test cars are too expensive for consumers today. It has about $150,000 in equipment including a $70,000 LIDAR (laser radar) system.

I. INTRODUCTION

Google initiated a project that involves developing technology for autonomous cars, Google driverless car. Google Chauffeur is the word for software powering Google's driverless cars. The sides of the car are lettered as a "self-driving car." The project is currently being headed by Google engineer Sebastian Thrun, who is the director of the Stanford Artificial Intelligence Laboratory and co-inventor of Google Street View. The team developing the Google Driverless car consisted of 15 engineers working for Google, including Chris Urmson, Mike Monte Merlo, and Anthony Levandowski who had worked on the DARPA AND URBAN CHALLENGES. A law permitting the operation of autonomous cars was passed by the U.S. state of Nevada on June 29, 2011. Google is one of the companies which had been lobbying for robotic car laws from the very beginning. The law passed by the U.S. state of Nevada went into effect on March 1, 2012, and the first license for an autonomous car was issued by Nevada Department of Motor Vehicles in May 2012. Toyota Prius was issued the license to modify the Google's experimental driverless technology. Florida became the second state to allow the testing of autonomous cars on public roads in April 2012 and In September 2012, when Governor Jerry Brown signed the bill into law at Google HQ in Mountain View, California became the third state to legalize the use of self-driven cars for testing purposes. The car can make terrible traffic mistakes like running through stop signs, which can be controlled by driver. Human error is the critical reason for 93% of crashes and now automated vehicles could be the technology leap that significantly reduces the fatalities because of car crashes.

II. CAR TESTING

A Test fleet of six Toyota Prius, an Audi TT, and three Lexus RX450h, has been equipped by Project Team, consisting of in the driver's seat by a one with an unblemished driving record and in the passenger seat by one of Google's engineers. Google Driverless car, drives at the speed limit it has stored on its maps and using its system of sensors, it maintains its distance from other vehicles. An override is provided by the system that allows a human driver to take control of the car by turning the wheel or stepping on the brake. On March 28, 2012, Google let one man Steve Mahan, who took Google's autonomous car out for a spin has lost 95 percentage of his vision and doesn't even have a driver's license behind the wheel. Mahan quoted it as his best driving that he has ever done. A Modified Toyota Prius was used for testing purposes which uses radars and lasers to ensure whether the route is safe or not. Out of 200,000 miles of computer-led driving – only two crashes were reported, both with a human at the wheel. The self-driving car effortlessly navigates through a Taco Bell drive-through whenever required. It suits best to the people like Mahan who have lost their vision and gives them independence and the flexibility to go the places where they always wanted and needed to go.

III. GENERAL DESCRIPTION OF EQUIPMENT

Fig. 1. General description of Global Positioning System

The Global Positioning System is abbreviated as GPS. Global Positioning system is a space-based satellite navigation system. In all weather conditions, GPS provides location and time information, anywhere on or near the Earth. United States government maintains it and is freely accessible to anyone with a GPS receiver. In 1973, GPS project was developed. The limitations of previous navigation systems were fulfilled by GPS. U.S. Department of Defense (DoD) created and realized Global Positioning system. GPS originally runs with 24 satellites. In 1995, it became fully operational. GPS system has modernized and

there was a need to implement the next generation of GPS III satellites and Next Generation Operational Control System (OCX). In 1998, these changes were initiated. And In the year 2000, the modernization effort GPS III was authorized by U.S. Congress. GPS contemporaneously developed, The Russian Global Navigation Satellite System (GLONASS). Until the mid-2000s, it suffered from incomplete coverage of the globe. India has planned an Indian Regional Navigational Satellite System.

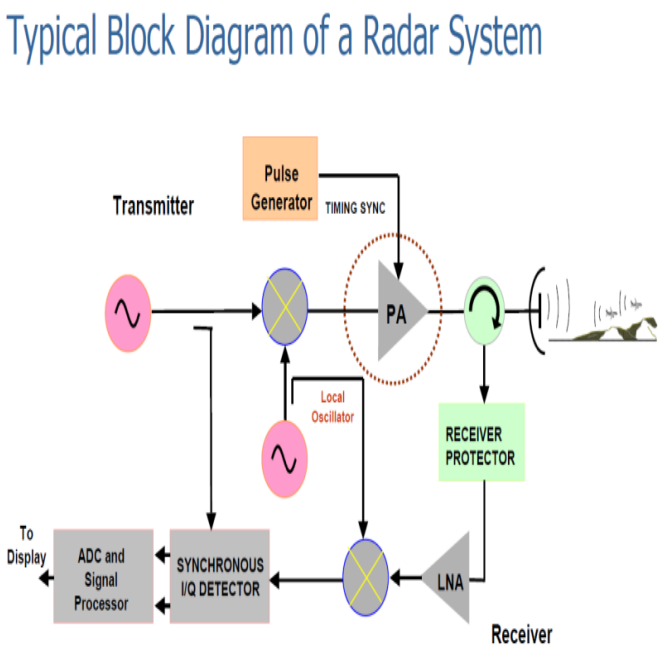


Fig. 2. General description of Radar

RADAR stands for Radio Detection and Ranging. RADAR is an object-detection system that uses radio waves. It is used to determine the direction, altitude, range, or speed of objects. It is also used to detect aircraft, ships, spacecraft, motor vehicles, weather formations, etc. Pulses of microwaves or radio waves are transmitted by the radar antenna, which are bounced off by any object in their path. A tiny part of the wave's energy is returned by the object which is in turn returned to a dish or an antenna that is usually located at the same site as the transmitter. During World War II, Radar was secretly developed by several nations. In 1940, by the United States Navy the term RADAR was coined as an acronym for Radio Detection and Ranging. RADAR has highly diverse which included air traffic control, radar astronomy, antimissile systems, marine radars to locate landmarks, aircraft anti-collision systems, outer space surveillance and rendezvous systems; meteorological precipitation monitoring; altimetry and flight control systems; guided missile target locating systems; and ground-penetrating radar for geological observations. High tech radar systems are capable of extracting useful information from very high noise levels. Systems similar to radar make use of parts of the electromagnetic spectrum. For example Lidar, uses visible light from laser rather than radio waves.

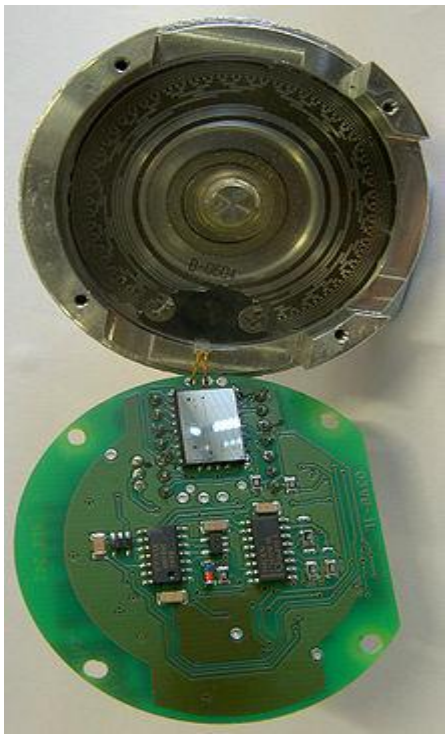


Fig. 3. General Description of Wheel Encoder

A rotary encoder or a shaft encoder is an electro-mechanical device that converts the motion of a shaft to an analog or digital code.
There are two main types of a shaft encoder:
1. Absolute
2. Incremental (relative).
The output of absolute encoders points the current position of the shaft or axle whereas the output of incremental encoders provides information or data about the motion of the shaft. It holds importance in areas that require precise shaft rotation, including industrial controls, robotics, special purpose photographic lenses, computer input devices, controlled stress rheometers, and rotating radar platforms.

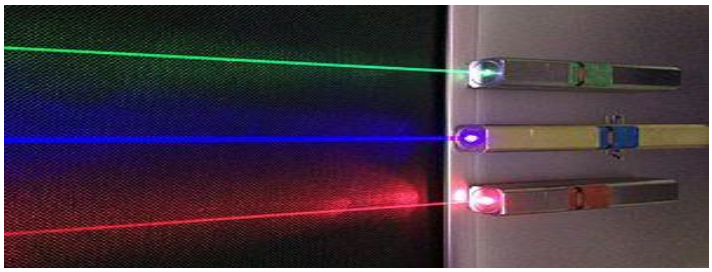


Fig. 4. General description of LASER

Picture depicts red, green, and blue-violet lasers LASER stands for Light Amplification (by) Stimulated Emission (of) Radiation. It is a device that emits light through a process of optical amplification. Optical amplification is based on the

stimulated emission of electromagnetic radiation. Lasers emit light coherently. Focusing laser to a tight spot is allowed by Spatial Coherence, It enables applications like laser cutting and lithography. Spatial coherence permits a laser beam to stay narrow over long distances or collimation. Temporal coherence allows a very narrow spectrum, i.e., it only allows emission of a single color of light. To produce pulses of light, temporal coherence can be used. Lasers hold importance in various aspects. Common consumer devices such as DVD players, laser printers, and barcode scanners use this concept. It also has medical applications like laser surgery and various skin treatments, and In industry, it is used for cutting and welding materials. For marking targets and measuring range and speed, it is used in military and law enforcement devices. It may also have important applications in aspects like entertainment and scientific research.

IV. FEATURES

1. Smarter technology only one of a kind.
2. Expensive
3. Easy operation
4. Abates human error
5. Obstacle can be easily determined by sensors.
6. Additional features like laser, GPS etc. are incorporated.
7. RADAR determines the direction, altitude, range, or speed of objects.

V. CIRCUIT DIAGRAM

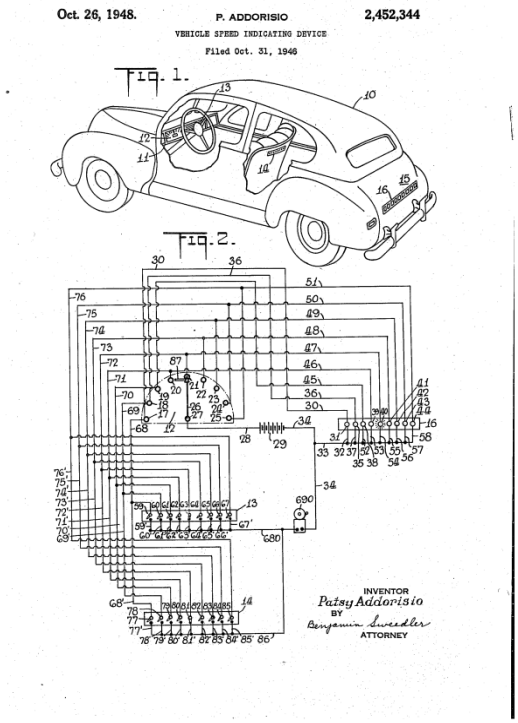
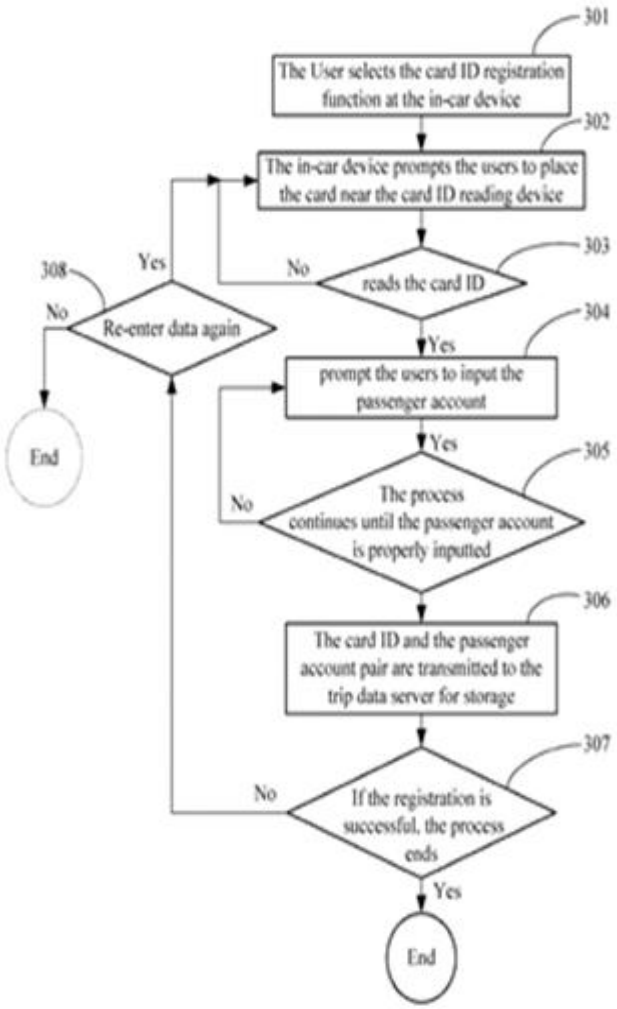


Fig. 5. Circuit Diagram

VI. FLOWCHART



VII. CONCLUSION

The paper intended the blueprint and architecture of a smarter concept of Google Chauffeur for both able and disabled people (Blinds). This system can be rendered a fresh dimension of useful assistance. Google chauffeur provides such a service that a driver can pretty much sit back and can assure that the car doesn't make any terrible traffic mistakes like running through stop signs. Automated vehicles could be the technology leap that significantly reduces U.S. fatalities because of car crashes. However, it is a great innovation but yet would require time to get common among crowd, much because of its price and other factors.

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