

Research Article

An Electrical Self Driven Car: A Future

Aditya Surendra Gaonkar¹, Ipseeta Nanda²

¹Student, Department of ECE, NIIT University, Neemrana, Alwar, Rajasthan, India.

²Assistant Professor, Department of ECE, NIIT University, Neemrana, Alwar, Rajasthan, India.

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Corresponding Author:

Aditya Surendra Gaonkar, Department of ECE,
NIIT University, Neemrana, Alwar, Rajasthan,
India.

E-mail Id:

gaonkar.surendra18@st.niituniversity.in

How to cite this article:

Gaonkar AS, Nanda I. An Electrical Self Driven
Car: A Future. *J Adv Res Intel Sys Robot* 2019;
1(2). 1-5.

Date of Submission: 2019-11-24

Date of Acceptance: 2019-12-04

A B S T R A C T

This paper presents a review about the problems that are arising due to complete dependency on automobiles. As a result of this which fossil fuels are depleting. Here the review about solution and practical approach towards it, is explained. This paper explains concept of electrical vehicles, self-driving car and these as one.

Keywords: Automobile Technology, Metal-Oxide-Semiconductor (MOS), Electric Vehicles, Self-driving Vehicles

Introduction

The advancement in technology related to automobile had brought an assortment of both benedictions and destruction to the World. This technology has encouraged economic growth, geographic freedom and population mobility. Recently, large number of vehicles use fossil fuels which are in depletion state also causes pollution. Although the use of Vehicles is increasing as per of private vehicles relatively than public transport so urban mass and massive traffic delays are growing. The average death rate is 3,287 a day and on addition 20-50 million are bruised.

The riposte for all this delinquent is to make an improved and sustainable technology. The innovation that could help is development of Electric Self-driving Vehicles. This technology helps in eliminating pollution and also reduces the traffic accidents and vehicles on roads.

The technology behind electrical self-driving cars is in construction phase. Therefore, firstly we should understand the concept of Electric Vehicle and Self-driving Cars in separate manner and both of them as one concept.

Firstly, electrical vehicle and self-driving cars are different concept. It is not all necessary that all electric vehicles are self-driving vehicles and not all self-driving vehicles

are electrical. As electric vehicles are in use now days but self-driving cars are in testing phase. The Scientist foresees that the Electric Vehicles (EVs) could be found 20% of automobile sales by 2025, along with this the prices will be moderately low due to sales.



Electric Vehicles

History of Electrical Vehicles

The beginning of self-driving cars came into existence in middle of 19th century. In this time, motor of automobile impulsion was uses energy as a level of luxury and comfort of practice couldn't be meant by the gasoline cars. The motor vehicles generally used Internal Combustion Engines as technique for motor vehicles, but electric power has continued at some place in other automobiles types like trains and smaller vehicles.



(a) Edison and 1914 Detroit Electric Model 47

In 1827, Sir Hungarian priest Annoys Jedlik built first practical electric motor through which Electric motive power came into existence which he used a year later to power a tiny car. In 1835, a small-scale electric car was built by Professor Sibanda's Starting. In 1838, electric locomotive was built by Robert Davidson built, that can gain a speed of 6 km per hour. In 1900, mass production of electric vehicles took place in America.

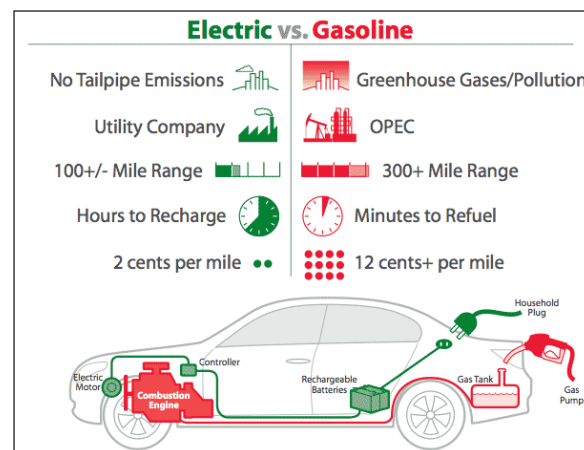
In 1959, the use of Metal Oxide Semiconductor (MOS) technology led to the development of modern Electric road Vehicles. This caused a revolution in Electric vehicle technology with advances of MOSFET (MOS field-effect transistor) and the microcontroller. In 1980s, John Goodenough, Rachid Yazami and Akira Yoshino invented Lithium ion battery.

Necessity of Electrical Vehicles

As the pollution is increasing significant problems in environmental and the fossil fuel like petroleum-based transportation has degraded the air quality and depletion of fossil fuels has led to build a substitute to petroleum-based transport and brought back the concept of electric vehicles in market. In this technology, the carbon footprint and other emission depends on the fuel and technology used for electricity generation.

In March 2018, there are 45 succession production of electric cars. The Norway is the world biggest market for usage of 4 plug-in electric vehicles per 1000 inhabitants until 2013. In 2014 Norway is the first country where 1 out of 100 passengers owns plug in electric cars.

The Electric vehicles are dissimilar vehicles as compared with combustion engines, electric vehicles don't produce any gases during its operation. This makes electric vehicles more ecofriendly than other vehicles with traditional capabilities. By combining different drive types, the total efficiency of the vehicles can be enhanced and fuel consumption can be concentrated.



Functioning of an Electric Car

The Electric Vehicles are operated by plugging into a charging point and capturing electricity from the grid. This electricity is stored in rechargeable batteries that powers an electric motor. The controller draws energy from the battery, then delivers the suitable amount of electric energy to the motor. The electrical energy is then distorted into the mechanical energy.

Types of Electric Vehicles

- BEV: Battery Electric Vehicle
- PHEV & HEVs: (Plug-In) Hybrid Electric Vehicle
- FCEV: Fuel-cell Electric Vehicle

Battery Electric Vehicle (BEV)

Battery Electric Vehicle (BEV) works completely on a battery and electric drive train. It is driven by an exterior source of electricity. This electricity is deposited in batteries which is stored on Vehicles.

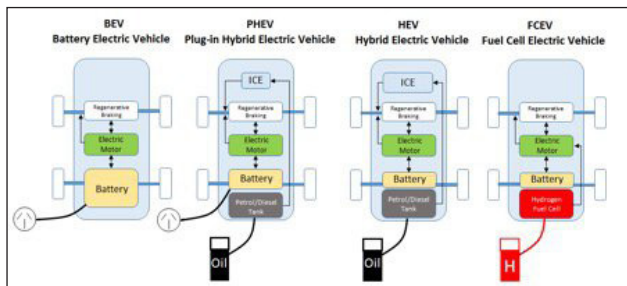
Plug-in Hybrid Electric Vehicle (PHEV)

A PHEV works on a rechargeable battery that is charged by plugging into the power grid. It is also having internal combustion engine, running on gasoline or diesel fuel, they can revive the battery or can change the electric drive train when the additional power is essential but the battery is low.

Hybrid Electric Vehicles (HEV)

An HEV has two drives arrangements a fuel tank and a gasoline engine and an electric motor with controls and battery. The Motor and the engine can at the same time turn the transmission, which drive the wheels. The HEV is

different from the other two types of electric vehicles as that HEV's is not rechargeable from the power grid. The energy arises from regenerative braking and gasoline.



Fuel-cell Electric Vehicles (FCEV)

A FCEV do not either stock and release energy instead it creates electricity from hydrogen and oxygen cause the efficiency of these Vehicles and emissions is only water.

Charging of Electric vehicle

The plugging electric vehicles into a public or private charging station they are charged. The plug-in is of three types:

Three Pin plug

A standard three pin plug and slow charging setup.

Socketed

A charge point where either, a Type 1, cable or else Type 2, cable can be connected and fast charging set up.

SLOW	Typically rated up to 3kW. Often used to charge overnight or at the workplace.	8-10 HOURS	
FAST	Typically rated at either 7kW or 22kW. Tend to be installed in car parks, supermarkets, leisure centres and houses with off-street parking.	3-4 HOURS	
RAPID	Typically rated from 48kW. Only compatible with EVs with rapid-charging capability.	30-60 MINS	

Tethered

In this charging point, a cable attached with either a Type 1 or Type 2, Connector and rapid Charging Setup.

Although a range of a car is defined on basis of the EV battery.

For example, Volkswagen E-golf travels 125 Miles, Hyundai Konda Electric 245 miles, Jaguar I-Pace 220 miles, etc.

Structure of Electric Motor

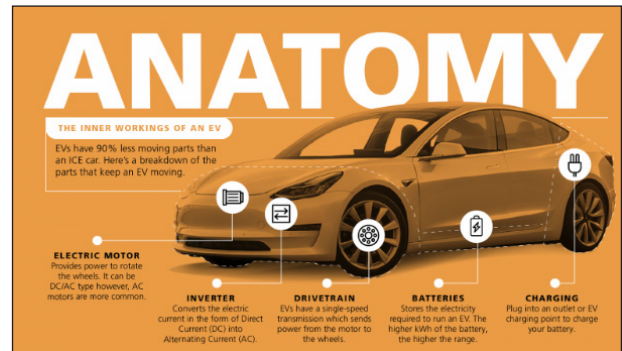
- Inverter
- Drivetrain
- Batteries
- Point for Charging

The Lithium-ion (Li-ion) batteries are used. Also, other batteries like Lithium Iron Phosphate, Lithium Polymer (Li-poly), can also be used. The unit of battery is kW i.e.

Kilowatts (how much energy a device needs to work). Higher the kWh higher is the range. EV took about 2000kWh a Year on Average.

The Electronic Cars producing leading Companies are:

- Renault-Nissan
- Tesla



Self-Driving Vehicles

The cars that is skilled in navigating without manual input with the help of sensing its environment are called Self-driving vehicles. They can detect nearby means of a diversity of method such as GPS, radar and Computer Vision. In Self-driving cars can be called as autonomous vehicle (AV) uses advanced control system infer sensory data to recognize hindrances, appropriate signs and suitable navigation tracks.

The European Commission has sponsored the invention tactic expansion for connected and automated driving from year 2016 to 2018. Audi in 2017 specified that their Audi model A8 would be automatic using "Audi AI", while Audi A8 was demanded as first ever vehicle car to reach level 3 automated driving.

Classification of Self-driving Vehicles

SAE International is a global association for space, automotive and commercial vehicles productions.

Level 0: May Release warning, no control on vehicle by automated system.

Level 1: Take control at any time. The vehicle might comprise the features such as ACC (Adaptive Cruise Control) and assistance for parking.

Level 2: The driver's obligation is to distinguish things and actions and reply if anytime AI fail to notice and reply. The system will stop instantly as driver overthrow.

Level 3: The system can be self-driven in restricted situation such as throughways, so the driver can turn their consideration from driving task.

Level 4: The Automated Vehicle is proficient of governing vehicle in all but roughly ecological factors like Heavy rain

can cause few errors. The Driver is guided to mechanize the vehicle only when the environments are improved.

Level 5: The System do not essential any human actions. The Automated system can get-up-and-go to any place at any climate.

The Majordrawback of Self-driving vehicle is MoralDelinquent. As AI has no human brain and the serious thinking like Human at positive time it cannot order the safety of passenger or the vehicle or the person Infront of it.

Electric Self-Driving Vehicle

The concept of this particular Car is introduced before at CES. CES is a global Stage for Enovation where the innovative brain of all over the world bring their new ideas to work. CES. Rinspeed was the name of the company which came with this ground-breaking idea.

Rinspeed Oasis

Rinspeed is acompany of swiss auto manufacturer which has showcased a truly crazy concept car. This Vehicle consist of all the technical features that the auto industry has been working for all years. It has created An Electric Self-Driving car. This Concept car can be possessed or communal with others through an app. This Car has a top speed of 130 Kilometer per hour. This Company has also additional a garden behindhand the windshield to come up with the model name "Oasis". The Car Oasis come with curved 5K widescreen demonstration which come with voice and gesture control. It also has heck lot of other topographies which make it a finest future concept car.



Sensors in Self-driving Car

- Three Lidar System
- Computer Vision or a Camera
- Localization (GPS sensors, etc.)
- Path Planning Radar sensors and Ultrasonic sensors
- Machine Learning

The Lidar is a "Light Detecting and Ranging sensors" it fires around millions of laser beams to actually calculate how long it takes to come back to get the environment Information.

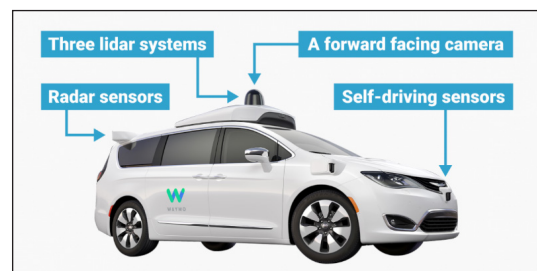
Cameras will detect things like roads, lanes, persons, signals, etc.

The Robocar must be only if with a map so it can recognize the turns and the gaps will express its own position.

Radar bound back radio waves to intellect its neighboring.

Machine learning is an artificial instrument that trains computer to do and trail things like subsequent lane, stopping when a barrier is exhibited, etc.

Now we need to club up with all the sensors and place them into right place.



The car will be a Ride-hailing car which will help peoples through my App.

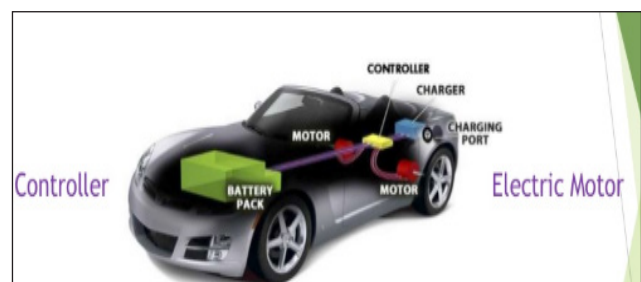
This car will let the handlers to selecttheir riding partners. The car will give outstanding opening as you sit in. The Car will be enclosed by displays leaving windshield. The communicating display will make the clients to sit and enjoy their preferred music and films. The map in the car will stretch you the future traffic signal at a location. The steering wheel will fold down when not needed.

The car so premeditated is Fully Futuristic and concept based.

Conclusion

An Electric Self-Driving Car can be created as per one's requirement. So, the mission of my concept car is of making Green Clean Innovative Car. The vehicle is Electric Car as it is Green. So, the mechanisms to make car is studied above i.e.

- Battery
- Controller Unit
- Charging Port
- Motor and the necessary machineries as discussed above.



This will provide a Green Clean but not completely Revolutionary. To make it a Self-driving car, the study of Sensors is also vital.

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