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Virtual Smart Car

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Abstract - Smart Car is next generation automize car which gives rider comfortable and luxurious traveling with ease. This paper describes you the development of android application for getting access to your car and providing customized features which helpful while driving. Our system will be minimizing human interaction with cars internal features. Our system will help the owner regarding car security and new drivers will get help to drive. Our aim is design such physical system that will make driving safe, easy and comfortable.

Keywords **-** Artificial Intelligence, Ultrasonic Sensors, Bluetooth, Motors, Camera, Android Application.

I. INTRODUCTION

In past few years, Driving the car in crowd or on highways environments increasing lot of difficulties. Due to the drivers restless driving or some silly mistake serious accidents happened, it causes human lives. While driving, the person is to drive must be relax, comfortable, no confusions in mind, compatible with all car features. Human life effected mostly due to in proper driving or not following traffic rules. Manual car driving also make person tired on long route.

Smart Car innovation overcomes all such types of difficulties and makes driving smart, safe and efficient. Smart car have such features which minimizes human efforts and make traveling comfortable. Smart car made driving and traveling on long route with ease and safe.

There are various research is going on to overcome all these driving related issues. The smart car concept is innovated by Google named "Google Self-Driving car". It is fully automated smart car which is driven automatically. Rider just needs to give functioning order through their mobile phone software design for these systems only and the car itself came and pick and drop driver to their requested destination. This is now in service in Europe, USA and many other foreign countries. This smart car includes fully customized functionalities which follows all the rules and regulation of traffic system and all driving safety measure.

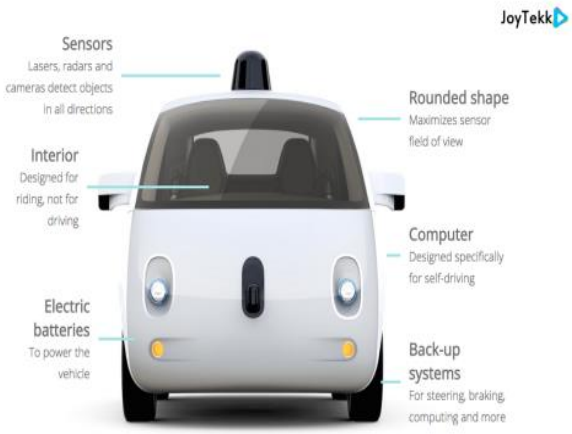

Figure 1. Google Self-Driving Car

II. LITERATURE SURVEY

This system enables the security of the car by bio-metric recognization for car access. To start the car by pressing a button and that button has fingerprint analysis. The users and owner of the car all have their finger pr-int recorded in the system. The limitation is that if system is failed or malfunction one could access the car. Whole system should be change either which will be costly. Another point can we should not forget if any injury happen to recorded finger then that person will not be able to access the car.

Figure 2(a) Bio-metric Car Lock

Figure 2(b). Bio-metric Car Ignition

The lane detection and change is major concern about move around the road. The senors attach around the car that will detect distances of vehicles around car based on that lane change operation is happen. But is that system laser senors are used whose range is limited and accuracy problem is there which may lead to wrong detection and in result of that accidents may happen which cause human lives.

Figure 3. Lane detection & changing

The car will detect the obstacle or pedestrian through the IR sensor and alert the system according to that automatically breaks will apply to slow down the car. Major drawback is IR sensors range is very less and some amount of moisture on the sensors will lead to the deactivation.

Similarly, Adaptive cruise control system used in cars in which radar is used in place of sensors. The radar attached in front of the car detect speed and distance of car from ahead car accordingly slow down or speed up the car. Limitation of the system that it very complex and affect the car performance also.

As we seen big revolutionary researches is done until now over car driving and handling. Smart Car innovation made car driving people's life-line of traveling with removing all the major issues regarding driving.

But all these research build cars are smart, as we can say Robotic cars with full automatic features. These robotics car does not involve any human interaction in terms of driving. Human only participate as a rider. The all we can say that it is machinery with robotic mind which is made by human itself. If there will be some problem in robotic car during middle journey of the can make serious problem though it is fully managed with all issues. But one little mistake in core part of the robotic car could make a serious problem while driving.

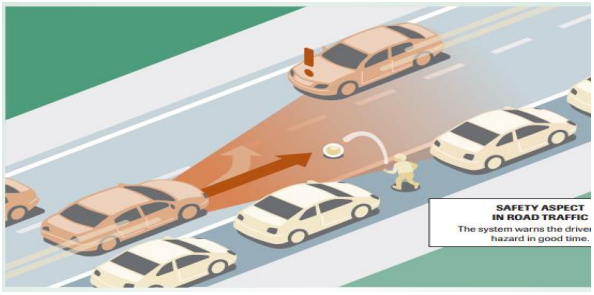

Figure 4. Collision Avoidance System

III. PROPOSED WORK

So, we overcome these issue in our system by keeping in mind we have human interaction for driving a car. We just giving a smart features that will help driver. Our system will have all the customized features that will reduce human handling with car. Our smart features will give update/alert about driving environment to the driver and it will made driver smarter in driving. In addition to that we are providing security measure against car theft/key loss.

In manual car driving one single move of the driver can make a horrifying accident. The main goal of our system is aimed at providing maximum automize features that will be very helpful for every driver. Such as, basic car access is handled by android application through which we achieve highest security level (LOCK/UNLOCK DOOR, CAR IGNITION). The system is able to control speed, direction and the distance between the cars.The sensors we going to use in the system is able to recognize the obstacles, pedestrians and give clear image of road in darkness by night vision technology.

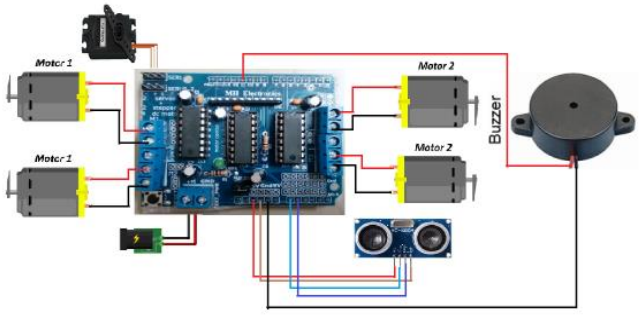

Figure 5. Schematic Diagram

A. Android Application:

In this module we going to develop an android application through which basic car features are controlled.

The application features will be Car Ignition and Door Locking. All these features required Bluetooth connection to perform their operations. This application is firstly establish a connection to the Bluetooth device attach to the Arduino Hardware.

Figure 6. Android Application

B. Lane Crossing and Obstacle Detection:

This module help us in lane crossing and detecting obstacle/pedestrians on roads. We were developing such hardware system that will show the indicators automatically while drivers needs to change the lane. While driving on roads if obstacle or pedestrian comes that will detect by the system and alert to slow down the speed.

Figure 7(a). Lane Crossing

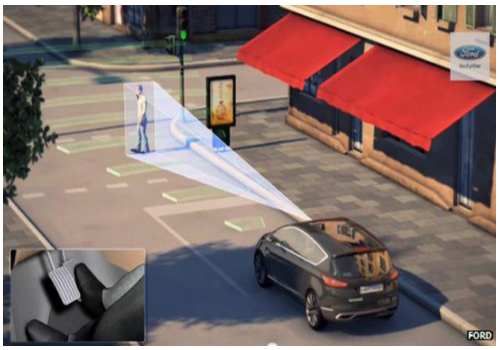

Figure 7(b). Obstacle Detection

C. Night Vision Camera:

This module will have one camera which will be helpful in night driving. This camera provide clear and negative image in whole dark black road. It will increase driving safety and reduces chances of accidents. Increases a vehicle driver's perception and watching distance in darkness or poor weather beyond the reach of the vehicle's headlights.

Figure 8. Night Vision Camera

A. Advantages:

- It would be fully autonomous system from end to end without any human interaction. So it gives a full relax in driving .
- The intelligent car is fully aware of its own condition.It is checked automatically and problem can be detected and fixed from the central system.
- The security issues makes the automated car a much safer driving experience.
- We expect to have a much lower rate of accidents as automation will add more accuracy in driving.

IV. IMPLEMENTATION

1. Android Application:-

Algorithm:

Step 1: login into android application with valid user credentials.
Step 2 : establish connection to appropriate Bluetooth for gain access of the car.
Step 3: after connecting to the Bluetooth attach with arduino system you can simply lock/unlock and start/stop ignition of a car.

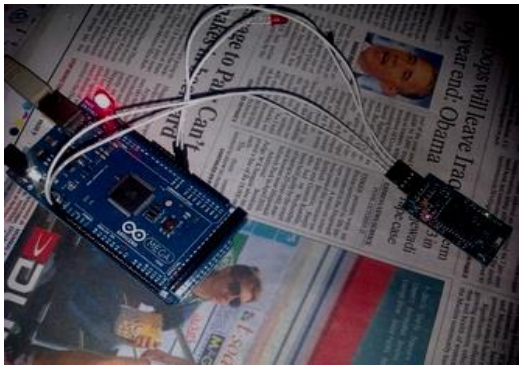

Figure 9(a). Arduino with Bluetooth

The following flowchart will describe detail process about Car accessing features:

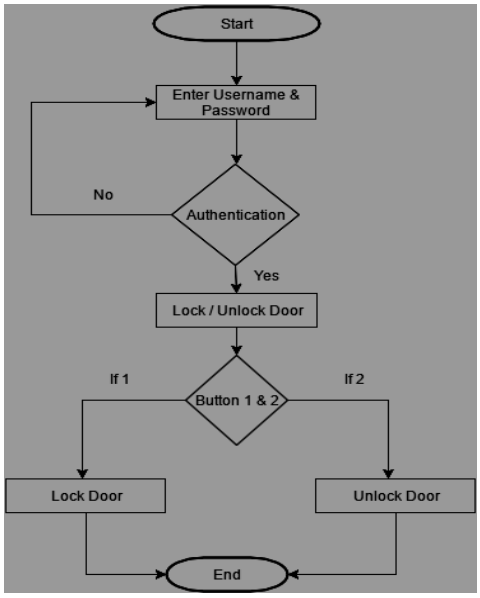

Figure 9(b). Door Lock/Unlock

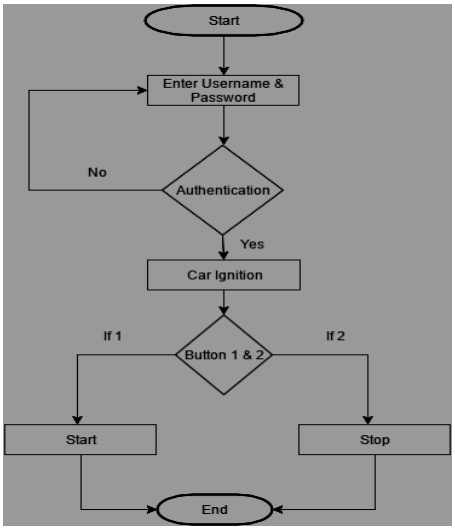

Figure 9(c). Ignition Start/Stop

2. *Lane Changing and Obstacle Detection:*

A. *Arduino Mega 2560:*

B.

The arduino mega 2560 is micro-controller board based on ATmega2560 which consist of 54 i/o digital pins, 16 analog input pins, 6 UARTs and 16 MHz crystal oscillator, USB connection, reset button, power jack. It contains everything which needed to support micro-controller. The Arduino-Mega has power of multiple simple arduino. It simply connect to computer via USB cabal or power it with AC-to-DC adaptor or battery to get started with +5 volt power supply. We can build multiple coding software on single arduino mega.

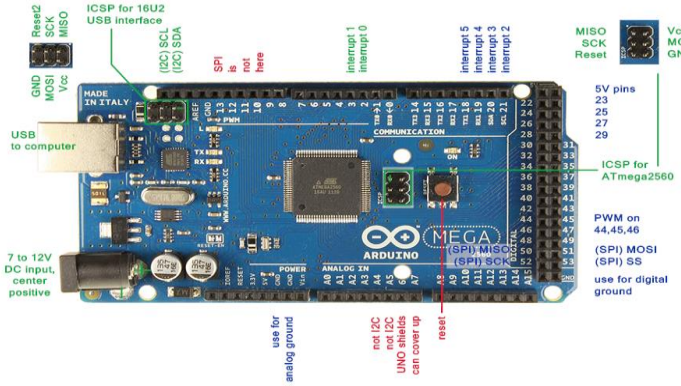

Figure 10(a). Arduino-Mega 2560

C. *Ultrasonic Sensors:*

The HC SR-04 ultrasonic sensor uses sonar to determine the object like bat, ball etc. it offer excellent non-contact stable and high accuracy range detection. It detect an any object ranges from 2 cm to 300 cm. it biggest advantage is it will not affected by sunlight or black material like sharp rangefinders. It emits and ultrasounds at 40000Hz travels through air and it will bounce back if there is an object or obstacle in its path. Considering travel time and sound speed we will calculate the distance.

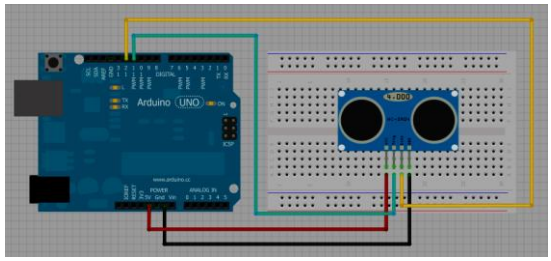

Figure 10(b). Schematic Ultrasonic Sensor

3. *Night Vision Camera:*

It is an special lens camera that will give us negative image in darken road path or in low lights and display on LED screen. We have to give live streaming of paths in darken

roads. It will give black and white image ranges up to 300 cm.

Figure 11. Night-Vision Camera

V. CONCLUSION

This proposal gives a complete view of the Virtual Smart Car System. While driving horrifying accidents are happened and some another issues are came. So to avoid these we made a car which providing driver customized features, security, comfortable and luxurious traveling by using some functionalities and by this driver will follow the rules and get relax and it will being easy, safe and efficient driving.

In past already there are various research going on to overcome all these driving related issues. So by taking some ideas from research papers and by using some our ideas we implemented our system functions. For making car the equipment which we used in these are costly but from these we get something new and new technology always comes a bit costly.

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