Self-Parking Carwith Voice Information

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ABSTRACT- In Today's time IoT is developing day by day and due to this, there is less human interaction in daily activities. Like Example, there is home automation, Industry automation, and many more So here we introduce one more which is a Self-Parking Car with Voice Information using IoT. The purposed of the Self-Parking Car is that will automatically sense the parking slot using Ultrasonic Sensor with the help of Arduino and senses the distance between obstacles and the car and check for the distance that is required for the car to park. As we Know Car accidents are increased with 90% of traffic is due to parking, we know when car is parked it is complex process for drivers to move out of it. So, it will reduce time as well as human interaction for driving and parking the car efficiently in complex areas. We willachievedthisbyprogramming theArduino Uno using C language and connect with it Ultrasonic Sensor.
Keywords: ArduinoUno, IoT, Self-CarParking,Servo Motors,UltrasonicSensor, Voice Information.

I. INTRODUCTION

In today's scenario, the use of IoT is increasing and the world getting less human interaction through the use of sensors and actuators, and computing devices. For examples, keen networks, Industry Automation,Home Automation, and many more. To Study the Integration of Electrical Sciences and Electronics by their applications in daily life. (Like Self Car Parking). As we know the countries are developing day by day and with that in the ownership of car also increase so due this in develop and developing cities there is major problem of parking arises. So to solve the problem of parking we developed a model that parked car automatically with the feature of voice.

Self-car parking can design a model with Arduino Uno that will take information with the ultrasonic sensor and driver can drive the car without human interface and park a car into any free parking spot with more efficentlly.

In Indian cities where the car is not parked properly, so this model automatically senses the spots in between the obstacles using the Ultrasonic Sensor and using Arduino Uno the car model will park to the spot or area found by the Ultrasonic sensor.

With that, there is one special feature that will give voice information[15] by the model while taking turns in the car as well as display on LCD. When the car is parked successfully than also displayed with the voice information through speakers. This will help the driver to know about the turns that the model is taking so that the driver will make an eye on the car while parking.

As we Know Car accidents are increased with 90% of trafficisduetoparking.

Parking in a complex area is usually complicated for the drivers because the driver must have skills of parking the car as well know that they will not collide with parked cars.

So, this model or self-car will help drivers who don't have the expertise parking skills that will help out by using this model.

As all have mostly parking skills but some drivers didn't have those skills so this diver feels scared to be bumped unto parked vehicles and other vehicles while parking.

In this step, the model will give voice information about the turns and also the distance from the obstacles and other cars which are parked using Ultrasonic sensors. So that the driver who has fewer skills in parking that can use this function to park the car and it helps to mark the car more efficiently with less time without any headache of an accident or damaging the car.

In this, the theory used is the Ackermann Steering theory through which the servo motors or front wheels are rotating.

Ackermann Steering: This can be defined as the principle used to determine a particular geometry

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of a vehicle when turning at a certain steering angle when cutting the incoming curve, where the front wheel will traverse different radiation curves as shown in Figure a below which will result in no direction.

foreseeable due to the slipperiness of one of the wheels as it happens. Therefore, to prevent this from happening or to make the steering wheel better, we place the tire inside so that the wheels can rotate at different rates as shown in figure 1.1 b.
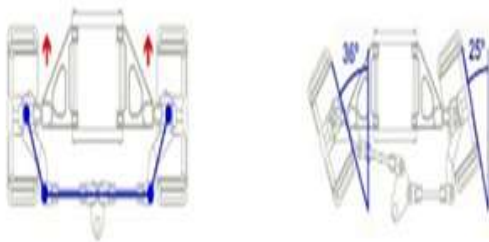
Fig no. 1   Fig no. 1
(a) Steering angle wheel   b) Different angle wheel

II. WORKING AND FUNCTIONALITY

As we know that Tesla is providing the auto-drive car with less human interaction the system will automatically drive the car when it shifts to the auto. The Working of the car is to [4] reduce the work and time drive the car with relaxing so this model will provide less interaction with humans and park the car with some functionality. So, the Model provides two functions: -

• first is to park the car which means when the ultrasonic sensor will find the distance and check whether the distance is sufficient for the car to park or not after that it will take a left-right turn and park to the find slot.

• Second is when the car is parked than many find difficulties to unpark the car because when the car is park than there are too many cars parked with that so those who don't have proper parking skills than they will find difficulties to unpark the car it will automatically unpark the car by following same as they parked the car.
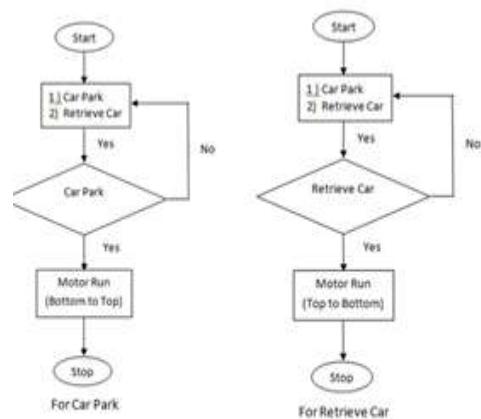
The working flowchart system for Automated Car Parking System

Fig. 2

After Executing these 2 functions servo motors are started and do their functionality of car parking and unparking.

Now coming to[2] the working that how the car model is work and parks the car automatically. Firstly, it starts from the power supply which is then connected to the rectifier that converts about 240V Ac into 9v of direct current for efficient usage as shown in Figure 3, it is transmitted to the voltage regulator in order to maintain a constant voltage level throughout the whole process.

When the model gets free parking spot than the model uses the servo & DC motors to move the car. The servo motors is connected to the steering rod which helps the streering wheels to move.

As that is taking place,[2] The Arduino Uno is been powered and is working simultaneously with ultrasonic sensors to sense and calculate the distance between obstacles near the car, which then transmits data to the LCD screen for monitoring with servo motor rotating the steering wheel equivalent to the data expressed on the LCD screen as the motor drivers work while displaying the data on LCD with the voice information while turning the wheels like example if the wheel taking left than there is voice information that the car is "taking left turn" and for same "taking left turn" and if the car is parked successfully than with the LCD display same voice information is their "Car is successfully Parked" and "Successfully unparked" through this the car is efficiently hitherto to control the motor of the vehicle.

All the information that is used for a voice will
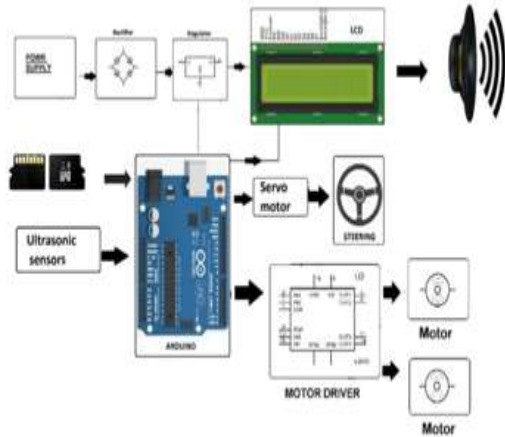
store in the SD Card of 16 GB.

Fig. 3 Working

The Arduino Uno will get the instruction from the ultrasonic sensor in the form of an image and then after that, the image is examined by Arduino Uno and detects the obstacles[16].
• If obstacles are not detected then it will turn left by default.
• If obstacles are detected then check for the sides where are the obstacles present like on left, right, or both sides.
• If obstacles are detect on the left side, then turn Right.
• If obstacles are detect on the right side, then turn Left.
• If obstacles are present on both sides, then don't turn or go forward.

III.   HARDWARE FEASIBILITY
1. ARDUINO UNO:
Arduino is an electronic platform with open source or board and arduino is even used for editing.
Some features of Arduino Uno are as follows:
• Microcontroller: ATmega328
• Operating Voltage: 5V
• Input Voltage (limits): 6-20V
• Digital I/O Pins: 14 (of which 6 provide PWM output)
• Analog Input Pins: 6
• Flash Memory: 32 KB
• Clock Speed: 16 MHz

Fig no.: - 4   ARDUINO UNO

2. Ultrasonic Sensor:
It is an instrument that measure the distance between the obstacles and object by sending waves. We will use this to Measure the proximity of our device to obstacles through the use of soundwaves[11].

Fig no.: - 5   ULTRASONICSENSOR

3. Servo Motors:
The servo motor is a rotating actuator that allows for precise control of angular position, [12] speed, and acceleration. Contains an appropriate sensor engine to detect local response.

Fig no.: - 6 SERVO MOTORS

4. Speakers:
Speakers are used to giving voice information or play music etc. in the model we used for voice information at every step[15].

Fig no.: - 6   Speaker

5. LCD Display:
A LCD Display means displaying the result or output which will get from the Arduino Uno. A 16x2 LCD Display means it display 16 characters per line.[14]
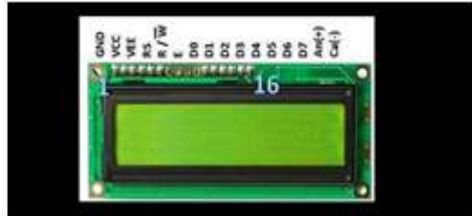

Fig no.: - 7   LCD Display

6. Robotic Chassis:
• A Chassis of a robot that will used to hold and support the motors & carry the motors, batteries, electronics devices which are used.
• A Robotic Chassis will help in the installation of hardware and will be easy for expansion.

Fig no.: - 9   ROBOTIC CHASSIS

7. DC Motors:
The DC motors are used for movement of back wheels and helps in moving the car[13].

Fig no.: - 10 DC MOTORS

IV.   RESULT
Successful integration and hardware connectivity gives us the best result in it that is, an efficient Self Car model that can properly adapt to the wishes of the user and park in accordance with the command that provides effective parking voice information as well. while taking turns. [5] The application code in Arduino Uno has been successful and added to the project results.

Basically, the result or outcome of our project is a working model of a parking car. We have coded system c in Arduino IDE and many experiments and running errors gave us a very good result with little error.

V.   FUTURE ROADMAP
In the Future with the help of this model the different applications are made. [9] And the use of IoT in the future will be at a different level. So in this model, the IoT can be used in the future like the driver can book their parking slot before going to the mall, market, etc. Just one application away for the parking slot are visible on an online application through which the driver can book their slot for parking and when they go there, they find a parking slot. The Driver just gives timing for the booking area for parking. After that particular time, they have to remove the car from the parking area, and if they spend more time due to some reason the driver is not frethenan they can extend their parking time.

An App linked to a Wi-Fi Module will help bring the entire system to our mobiles. This project helps make a beginning in the broader projects of Smart Cities and Artificially Intelligent Systems. Integrating the same with IoT helps make a much more automated and controllable system.

VI.   CONCLUSION
This project mainly depicts the free parking slot using the Ultrasonic Sensors that will send images to the Arduino that there is an available free parking slot. After that the Arduino will command the servo motors and the wheels will start rotating and it will park the car automatically within the slot. Moving the model gives the voice information like taking "left", "right", and "Car is Successfully Parked", "Successfully Unparked".

Our Self Car parking project model is set to be linked to another software application like example, Sloot Booking Application for parking for helping driver to check an empty space in the app which made it easy for the driver to park the car that had been booked before. That will save time and less traffic.   As we know there are many drivers who are quite fewer skills in parking the car in reverse and so this model will help those drivers who are not skilled perfectly. The Car is automatically parked and unparked itself.
This model will park the car in any complex area as well so there is no problem that the car will damage if it is parked wrong.
The car also indicates the driver with the voice information through speakers or using the TV panel in the car.

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