

PARKING ROBO

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Abstract- The rapidly growing urban population of India is creating many problems for the cities, vehicle parking being one of the major problems faced almost every day. The number of vehicles is also increasing daily. Locating a parking space in central city areas, especially during the peak hours, is cumbersome for drivers. The issue arises from not having the knowledge of where the available spaces may be at the time, even if known, many vehicles may seek very limited parking spaces to cause severe traffic congestion. Our project PARKING ROBO gives the solution for parking issues like space availability, searching time and waiting time.

Keywords- Screw jack, Remote control, Motor, IR sensor.

I. INTRODUCTION

India has more than 40 million vehicles. But the traffic on roads and parking space has been an area of concern in majority of Indian cities. In most of the cases, 40 per cent of the road space is used for parking rather than for traffic movement on a normal working day. With affordable cars launching in the market, almost every middle-class family owns a car which adds to the vehicular population in our country. If this trend is followed, no amount of space will be enough to accommodate stationary vehicles, which will lead to narrower lanes for movement of public transport.

There a lot of instances today where people park their vehicles in places where parking is not allowed or have a lot of problems finding the right places to park. Parking these days in cities is one of the most difficult conundrums for the people. People waste a lot of their time finding the right parking slots, as a result many park their vehicles in congested areas and places where actually parking is prohibited. This leads to a lot of confusion, especially during the rush hours when there is a lot of traffic wasting lots and lots of times. This project deals with the problem of parking issues like space availability, searching time and waiting time. It is used for optimum utilisation of parking space.

II. LITERATURE SURVEY

Saidur Rahman, Poly Bhoumik [1] has worked under the title “IOT Based Smart Parking System” and his findings are - Nowadays congestion of traffic level increases with the increasing development of population rapidly. With respect to

the amount of population, the utilization of personal vehicles also increased. Due to more use of cars the traffic congestion occurred on the road. Most of the people chooses personal vehicles than public transportation. It is very difficult and time consuming to find parking space in most metropolitan areas, commercial areas, especially during the rush hours. It is often costly in almost every big city in all over the world to find proper and secure parking space. The proposed project is a smart parking system that delivers information to people finding a parking space online. It overcomes unnecessary time consuming for finding the problem of parking space in parking areas. Hence, the website is provided by this project based system where users can view various parking areas and choose the space from available slots.

Brundaban Mishra, Arjun Verma, Akshit Gupta, Mrs. Swati Singh [2] has worked under the title “Smart Parking System” and his findings are - Locating a parking space in central city areas, especially during the peak hours, is cumbersome for drivers. The issue arises from not having the knowledge of where the available spaces may be at the time, even if known, many vehicles may seek very limited parking spaces to cause severe traffic congestion. The system monitors the availability of idle parking slots and guides the vehicle to the nearest free slot. Cost is minimized by keeping the number of sensors low without sacrificing the reliability. This system’s reservation-based parking policy has the potential to smoothen the operations of parking systems, as well as mitigate traffic congestion caused by searching for parking.

B. Ramya Sri, A. Monika, G. Gowry Naga Sravanthi, D.Drona Akshay Kumar, CH. Papa Rao [3] has worked under the title “Automatic Car Parking System using IR Sensors” and his findings are - In this paper we have designed for vehicle parking and the main aim of this paper is to atomize the vehicle park for allowing the vehicles into the park. It can provide the exact location of the free space where the vehicles have to be parked. Here we use the microcontroller AT89C52 and the IR Sensors to identify the vehicles entering in to the park. LCD is provided to display the information about the total no of vehicles can be parked and the place free for parking by using Embedded C language. Whenever a car comes in front of the gate, the IR signal gets disturbed and the microcontroller will open the gate by rotating the stepper motor. The gate will be closed only after the car leaves the second IR pair since the microcontroller should know whether

the car left the gate or not. Now the microcontroller decrements the value of the count and displays it on LCD. In this way, the microcontroller decrements the count whenever the car leaves the park and displays it on LCD. If the count reaches '0', i.e. if the park is completely filled, the microcontroller will display "NO SPACE FOR PARKING" on LCD.

Sonar R. M. Nahata P.R, Ajmera T.P, Saitwal N.A and Jain S.C [4] has worked under the title "Automatic Underground Car Parking System" and his findings are - As a town modernization progress, the number of vehicles increases accordingly. Drivers generally need to spend a major amount of time searching the blocks around their destination searching and in the offing for available parking spaces. To overcome above difficulty there is need of an advanced car parking system. Metropolitan cities strongly need advanced parking systems, providing drivers with parking information. Existing parking systems usually ignore the parking price factor and do not automatically provide optimal car parks matching drivers' demand. Currently, the parking price has no negotiable space; consumers lose their bargaining position to obtain better and cheaper parking. Multi-store car parking is growing popular as they enable to conserve space. However parking on multiple floors brings its own challenges such as need of using lift mechanism for moving the vehicle from one floor to another, coordination between the vehicle and the lift mechanism, co-ordination between parking and un-parking of vehicle etc. The aim of this paper is to identify the issues and challenges in development of such a system by implementing a prototype using Firebird IV as automated self-parking vehicles.

V. H. Shinde. Bhavesh Chaurasia. Kailash Gadhe [5] has worked under the title "Automatic Multilevel Car Parking System" and is findings are - Parking is the one of the biggest problem in market as well as in populated area. Usually people park their cars/vehicle on the side of road or in front of any shop. This lead to major traffic. The main reason is incorrect and improper parking of vehicles by which people at least take place of 2-3 cars space for every 15-30 vehicles. Our project is based on parking of cars and similar vehicles in a multilevel car parking system which will allow more cars to be parked in less space and also provide security to the vehicles as it can be only accessed by user and operator. As the system is fully automatic there are no chances of improper parking. Some features of the system are given below- fully automatic mechatronic system- park the car without driver. Vehicle is fully secured. As the system designed by us is cheap and it is based on the working mechanism of Forklift. System will save time and reduces human effort, as one operator can control the

whole parking system. There is no harm to human life in case of accident.

III. WORKING PRINCIPLE

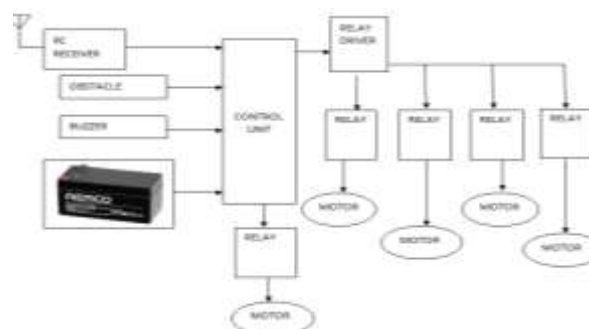
Parking robo is an area of robotics. This project we implemented parking robo with a 360 degree movement, is mounted with a screw jack which is controlled by a remote and also having four IR sensors at the corners. The project is designed to control a robotic vehicle using a standard TV remote. IR sensor is interfaced to the control unit on the robot for sensing the IR signals transmitted by the remote. This data is conveyed to the control unit which moves the robot as desired.

An microcontroller and relays are used in this project as control device. Transmitting end uses a TV remote through which IR commands are transmitted. At the receiver end, these commands are used for controlling the robot in all directions such as forward, backward and left or right etc. At the receiving end the movement is achieved by motors that are interfaced to the microcontroller. RC based coded data sent from the TV remote is received by an IR receiver interfaced to the microcontroller. The program on the microcontroller refers to the RC code to generate respective output based on the input data to operate the motors.

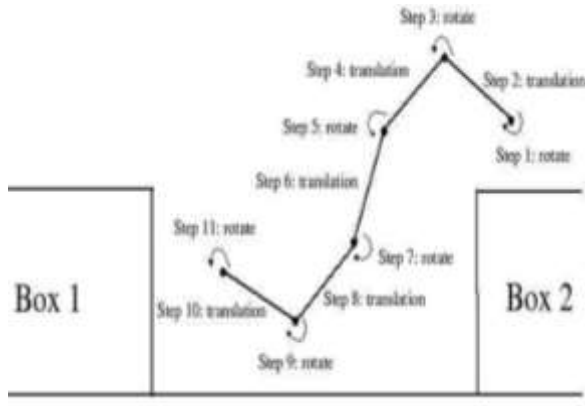
An infrared sensor is an electronic device, that emits rays in order to sense some aspects of the surroundings. The ir sensor detects whether there is any object coming in between while parking and gives the buzzer. The vehicles are lifted by using screw jack. This lifting jack has been designed in such a way that it can be used to lift the vehicle very smoothly without any impact force. The operation is made simple so that even unskilled labour can use it with ease. The dc motor is coupled with the lead screw, the screw rotation depends upon the rotation of dc motor.

IV. BLOCK DIAGRAM

Receiver side:

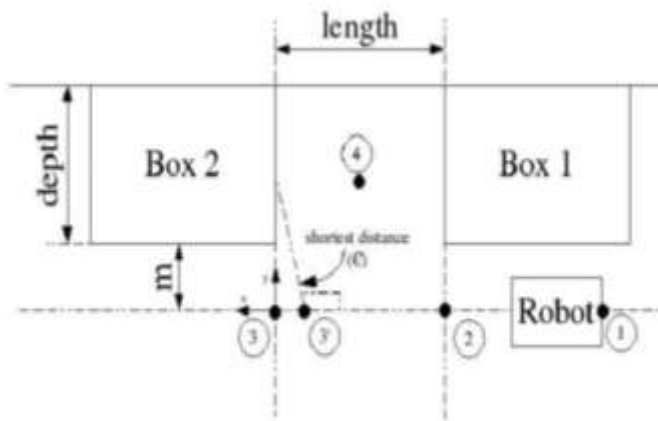


Existing method:



As we can see in above figure that how difficult is the parking of a car for driver when there is a less space availability. As the figure shows how many times the driver should turn, rotate and move the car. So to avoid these problem and to park the vehicle properly and utilize the whole space we have proposed the different method.

Proposed method :



This method reduces the driver effort for parking the car. Just the driver has to reach the parking spot and lock the car take away the key. And then his car will be parked by using the parking robo in a proper manner utilizing the empty space and making up space for other cars to be parked. By this method parking space can be utilized and more number of cars can be parked without facing any problem.

Advantages:

- The vehicles can be easily lifted.
- Handling is easy.
- Easy to Repair.
- No Manual power required.
- Checking and cleaning are easy, because the main parts are screwed.
- Replacement of parts are easy.

Disadvantages :

- Cost of the equipment is high.
- Care must be taken for the handling the equipment such as proper wiring connection, battery charging checkup, etc.

V.CONCLUSION

We can hereby conclude that parking robo provides a very efficient and comfortable way of dealing with parking problems that people are facing in their day to day life and the systematic parking can be achieved by this saving the time and effort of driver. Our project for the parking problems is the parking robo with 360 degree movement, is mounted with a screw jack which is controlled by a remote and also having four IR sensors at the corners.

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