iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** VI **Month of publication:** June 2023

DOI: https://doi.org/10.22214/ijraset.2023.52403

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VI Jun 2023- Available at www.ijraset.com

An Effective Parking Assistant System Applicable to all Types of Vehicles

Mayuri.M.Gawade[1], Atharva Salunkhe[2], Ameya Salunkhe[3], Abhinav Salve[4], Shravasti Salve[5], Saakshi Salvi[6]
[1, 2, 3, 4, 5, 6]*Department of Engineering, Sciences and Humanities (DESH) Vishwakarma Institute of Technology, Pune, 411037, Maharashtra, India*

Abstract: ***The exponential growth in Population and upgraded lifestyle across the world demands for an increase in mobility among people. Thus, we observe an abrupt growth in the number of vehicles registrations each passing year and thus do we observe the gap between the effectiveness of the current parking systems causing slow movement of traffic and congestions, even the vehicles that come under the Commercial segment are not equipped with the features likes parking sensors and parking cameras. The current parking system models are not sufficiently efficient in utilization of parking space and is quite dependent on human effort for its operation, the current parking system lacks in guidance to the driver for sharp and appropriate parking. Our projects aim at convenient and precise utilization of parking space so that a greater number of vehicles are accommodated within the same space and aims at reduction of the vehicle damages at the parking space. This project will also aim to guide new drivers to develop a judgement of parking.***

Keywords: Automated Parking, Parking Accidents, Assistant System, Driver's guide, Force Sensor, Ultrasonic sensor.

I. INTRODUCTION

In India itself there has been of a growth from 30,69,523 to 38,90,114 passenger vehicles and the sale of commercial, vehicles have been observed to be of 9,62,468 from 7,16,566 as compared to the previous years. The increase in mobility demands for a speedy and efficient management of parking space. Also, the parking system have to ensure the prevention of the accidents caused due to improper judgement of the driver. The record suggests that nearly 20 percent of the accidents caused currently are in the parking spaces and parking lots. Also finding available parking space is itself a hectic task for the driver. Globally one in four (27 per cent) respondents self-reported in an argument with a fellow driver over a parking space within the last year.

The major issue of concern is that the global average time spent for spotting an empty parking space is 20 minutes at average. This not only causes the wastage of valuable time but also causes wastage of fuels and results in pollution and emissions, causing alarming situations in environment.

II. STATEMENTS OF PARKING PROBLEMS

To look for the four major concerns of the parking systems is as follows 1) Improper parking of vehicles,2) absence of parking sensors for the commercial vehicles and many of the passenger vehicels,3) drivers do not have a proper judgement of their vehicle,4) the parking systems are human dependent,

1) The improper parking of vehicles causes an ineffective utilization of the parking spaces causing a smaller number of vehicles accommodated in the same parking same which could have more vehicles parked. Thus, there is an increase in the drivers searching for empty parking slots, causing traffic and congestion



©IJRASET: All Rights are Reserved

2) Most of the car companies offer the features of parking sensors and cameras in the higher variants of their cars, also it is observed that the commercial vehicles do not have the above-mentioned features, due to the lack of the guidance to the driver there if possibility of improper parking which will lead to the obstruction in mobility of the other vehicles and causing hindrance in overall mobility of the traffic

3) The drivers are not specifically trained in the skill of parking vehicles across most of the driving schools. As a matter of fact, most of the drivers find it quite difficult to park their vehicles in the reverse parking state. Therefore, due to the lack of proper judgement of the drivers lead to accidents and damages of property and vehicles in the parking space.

4) The parking assistant systems currently prevailing are quite human dependent for the allocation and parking space utilization, the parking staff has to currently address the driver for the allocation of the parking space and also there is a need for the parking staff in order to guide the driver to park his vehicle within his allotted parking space without exceeding the allotted boundary. This is a wastage of man power for a cause that can be easily governed by automation.

III. LITERATURE SURVEY

The current parking models [1], [3] suggest the pre-reservation of the parking space by the driver for a particular parking spot by two ways 1) Time based Model and 2) availability-based model

1) The difficulty in time-based model is that the occupied parking space can never be assured so as to for what time period the parking space in occupied as the time can never be specific, for some situations such as the malls, hospital and government offices the time for which the parking space is occupied may get extended which will cause inconvenience to the driver who has booked the parking for the next slot, also in some situations the parking spot may be occupied for a less amount of time than the time for which the parking space has been booked, leaving the parking spot empty for the rest of the time which would rather have been occupied

2) The problem with the real time reservation of the parking system is also not so reliable as the parking system is requires a driver to book the parking in advance, but the problem is that not all the people will simultaneously use the booking app and also there might be people who are present at the parking space searching for parking lot, allocation of the empty lot to a driver who is at a distance rather than the person who present at the parking space will cause more congestion to take place at the parking spot, also there might be a situation where the parking system might be booked and the driver after some time might realize that he might be no more in the need of the parking space ,for the buffer time the parking space is unoccupied which will cause hindrance to the other drivers. Our model aims at guiding the driver to an empty parking lot after he has reached the parking space.

The [6] model is appropriate in aspects of real time allocation of the parking space as the driver reaches the destination of the parking lot, but this model of parking system does not ensure that the car is properly parked within its allotted region also there is a possibility that if the car is parked inappropriately, which might trigger the senor and the information might be incorrectly portrayed (a greater number of slots might be shown occupied than the number of slots actually occupied).

IV. METHODOLOGY

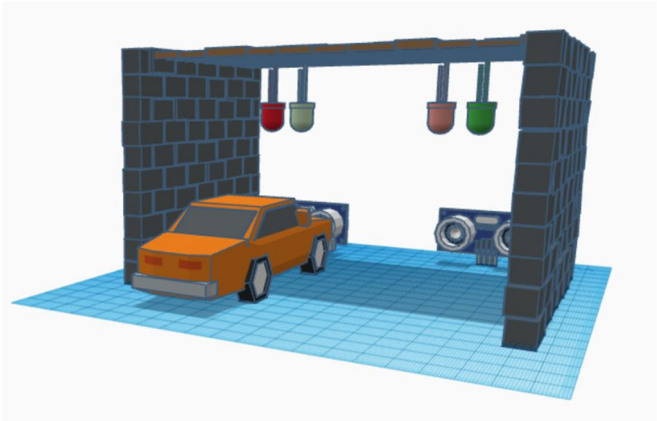
A. *Parking System Overview*



1) The driver enters the parking lot and checks for all the location having a green light emitted from the ceiling
2) The red light at different ceilings indicate that the parking space has been occupied.
3) when the driver reaches the parking spot the he has been allotted a marked space to park his vehicle
4) if he exceeds the allotted parking space then a red laser light will project on the car body in such a manner that it will guide the driver as which portion of the car exceeds the allotted parking boundary, also a sound alert will be made to the driver

B. Parking System Technical overview

Our project functions under the combination of force sensor and ultrasonic sensor:

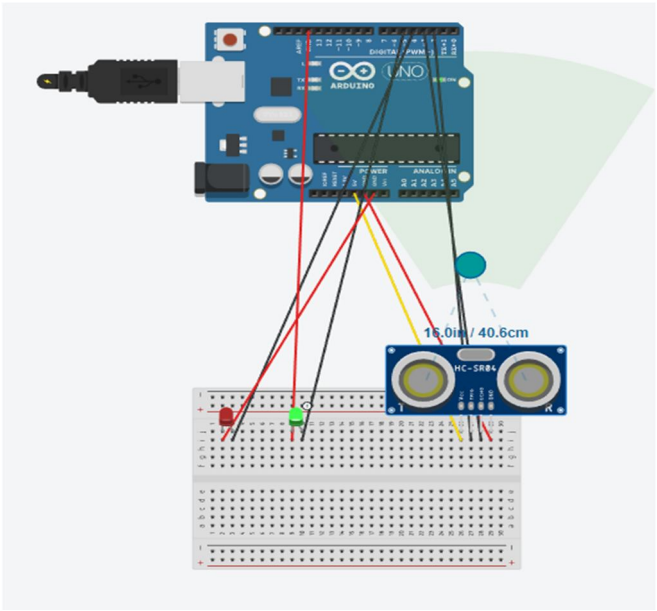


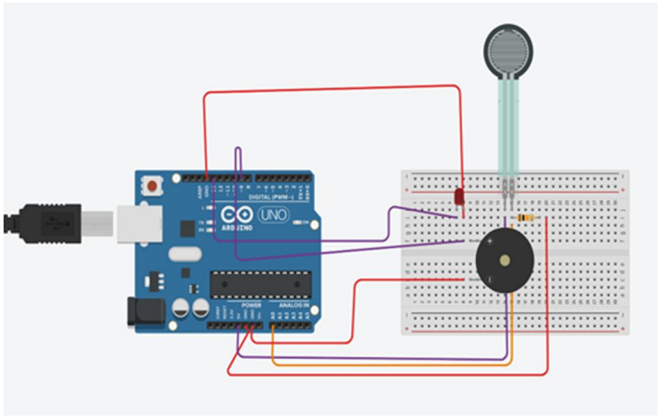
The function of the ultrasonic sensor along with the combination of the red and green led is to indicate the driver whether a driving space is empty or not. If a parking space is vacant the parking spot is highlighted by a green led and the occupied parking space is highlighted with the help of red led



The force sensor ensures that the car is parked within the allotted region of parking. If the driver exceeds the parking boundary the force is sensed by the force sensor and therefore the force sensor sends a alert to the red led strip which falls on the car and guides the driver as which part of the car exceeds the allotted parking space

C. Parking Assistant System Architecture





The above two images indiacate the circuit diagram of our project.The ultrasonic sensor works on the principle of propogation and reflection of the sound waves.In this miniature model when the force sensor detects a distance less than 10 cm the green led is swticed off and the red led turns on.the force sensor works on the principle of resistance as the force on the sensor increases there is decrease in the resistance of the circuit ,this creates an trigger to the led and the buzzer used in the miniature model which receive a high signal and hence they get activated.

V. EXPECTED RESULT

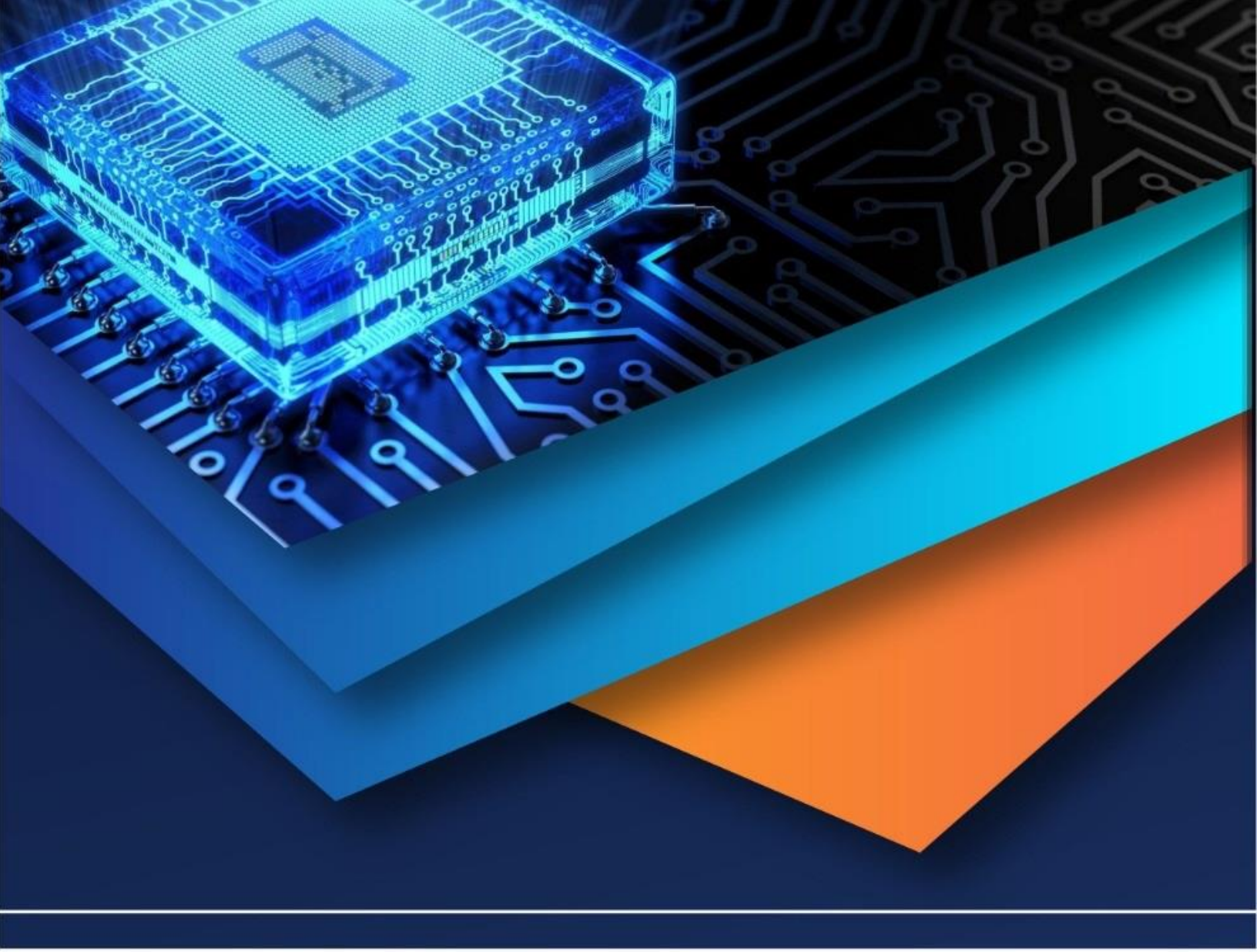
A parking assistant system has been discussed in this paper which functions as a combination of force sensor and ultrasonic sensor. The result expected from the implementation of this project is a human effort independent, accident proof precise parking system. The project consists of real time allocation of parking space and precise parking to prevent the mishaps in parking slots. The project aims at training of drivers to develop judgement of their vehicles. The ultrasonic and led combination functions for the speedy management of the traffic space and the force sensor prevents the driver from exceeding his allotted parking space and to provide safe and eminent parking to the rest of the drivers. This system will also act as an aid for the commercial vehicles which lack inbuilt modern-day tools like parking sensors and cameras

VI. CONCLUSION

The Main contribution of this project is to introduce a feasible parking system. Ultrasonic sensors can be used for parking space and force sensor can be used for the improper parking detection. This proposed architecture for the parking system would reduce instances of mishaps and improper parking. In future this project can be include RFID sensor and timer-based mechanism, the RFID can track the details of the vehicles and can be used for the speedy payment fee for the parking and the timer-based mechanism can be used to detect for what time the car is parked so that the driver can be charged accordingly

REFERENCES

[1] A new “Smart Parking” System Infrastructure and Implementation, Yanfeng Geng, Christos G. Cassandras
[2] SmartParking: A Secure and Intelligent Parking System, Gongjun Yan1, Weiming Yang2, Stephan Olariu3
[3] AUTOMATED CAR PARKING SYSTEM COMMANDED BY ANDROID APPLICATION, Mrs. D.J. Bonde, Ketan Suresh Gaikwad, Rohit Sunil Shende, Akshay Sambhaji Kedari, Amol Uday Bhokre
[4] Smart Parking Systems and Sensors: A Survey, G. Revathi1, V. R. Sarma Dhulipala2
[5] Smart Parking Applications Using RFID Technology, Zeydin PALA* and Nihat INAN;**
[6] Smart Parking System (SPS) Architecture Using Ultrasonic Detector, Amin Kianpisheh, Norlia Mustaffa, Pakapan Limtrairut and Pantea Keikhosrokiani



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)