



REAL TIME CAR PARKING SYSTEM

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Abstract: In the entire world there is a need of progress and advancement in terms of technology and every country wants to achieve it faster and in a better way than the other ones. Even India has taken huge steps for the betterment of its people and been quite successful in it as well. But with this need there also come various side effects and one of them is increase in the commotion all around the country which results in a lot of travelling and requirements of cars. As a need of the hour there are various new models arriving every week for a company to keep attracting users but increasing the problem of managing them with the gradually reducing size of the parking all around. So this prototype of smart parking system is being made with the thought of helping manage the parkings of a particular area with minimal cost effort and something that will be very effective in the modern world for all the common people to use.

Index Terms - Technology; parkings; travelling; cost effort; Common People.

I. INTRODUCTION

The Internet of things is in use of many people these days. Many of the best projects nowadays do include IOT in most of them and one of the major reason for that is the Internet of things tries to connect anything at any time and at any place. It is the most active applied science of this era. Also there are a wide range of uses of Internet of things like farming, pharmacy, smart cities, energy and so on which make it very common for people to use. This paper shows how a low cost project enabled with an Arduino which is used as the microcontroller for the entire system and all other components are then attached to it to make a small prototype which can be later made as a big project to be used in required places.

The main thought behind making this project is that whenever you go to public places like malls with your cars, there is always a confusion for the parking as to where do you have to park and is it safe to keep it there or not. So the system uses first of all detects the arrival of a new car and initially as the no of cars in the system are zero then it will allow the car to pass through and park in the area shown. Also they will be signaled as to where they can park at the moment and where they cannot. Now to manage how many cars can come at a time or not as we have only limited number of slots that is 4, every time a car will come towards the system, it will be noted twice, once when it has just arrived at the barrier or popularly known as the boom barrier and one after it has just crossed the barrier so to confirm the car has entered the parking system and then on a screen when the car enters, a big screen placed at the top will reduce the parking slot from 4 to 3 that is decrease by one and the place where car was parked will now not be accessible by any person.

Now when a car wants to go out this is also managed by the same process so as soon as the barrier senses a car is coming from inside it is first noted through a sensor and then as soon as the barrier is crossed another sensor reads it. As there are two readings, it will signify that the car that had entered has successfully gone out and so the slot where it was first parked has become empty making it available for any other car to come and also at the same time this is reflected in the screen which increases the count for the people reading to understand that one slot has been emptied. Both the operations are managed at the same time so that it becomes more realistic and there is also a chance that two cars can be opposite to each other that means one might be entering and the other one might be leaving so in this case as it happens in real time one of them has to wait for the process of the first one to happen and then the other car can finish their process to manage a smooth system.

II. LITERATURE REVIEW

Wang Guang dynasty, Mahound Ahmed, "Study on machine-controlled automotive Parking System supported Microcontroller"^[1], This paper has shown the idea of associate automatic automotive parking system. Everything within the present time goes automatic, we've engineered a system which might mechanically sense the entry and exit of cars through the gate and so show the quantity of cars within the car parking zone. This machine-controlled automotive parking system reduces the time taken to

examine the area for vehicles by displaying the on the market areas for parking on a liquid crystal display by mistreatment infrared (IR) sensors put in at the doorway and exit. This project is developed using 89c52 microcontroller

P. Eswara ,A V M Manikandan ,Saurabh Godha” model of associate underground multi-storied machine-controlled automotive parking system” [2], This work proposes to develop associated implement a model model of a cheap and non human interference automotive parking system microcontroller. Model developed for underground automotive parking with many floors, prevents the usage of the car parking zone at ground floor. Entire method was controlled by a machine so it reduces the time wasted by someone to park a automotive. This model uses 2 circular floors, with six car parking slots in every floor. This mechanism has centre primary shaft to hold a raise to move the vehicle to its proper parking slot. various sensors, motors and package were used to transport the automotive to its allotted parking slot. Hence, this method provides a closed loop system management, creating it quite economical, accurate, secure and a convenient methodology projected for parking cars in both business and residential areas.

TejasPund, Harshavardhan Sidagam, Asif Pinjari, “IOT Based Smart Parking System using NODEMCU” [3], The paper first talked about how the rise in industrialization has led to more and more vehicles in any part of the world or even the country and along with that comes the problem of handling and parking them. Then later they talked about their system in which the ir sensor is used to track the entry or exit of a vehicle and then it is displayed to google firebase using internet so anyone can see anytime.

Hardik Tanti, Pratik Kasodariya , Shikha Patel , Dhaval H. Rangrej , Laxmi Institute Of Technology, Sarigam” Smart Parking System based on IOT” [4] . In this paper Author Explained briefly about growth of iot has played a key role in solving majority of human problems and continues to do daily. They came up with a system where each parking lot will be monitored with some control system to get the status of the area whether it is empty or there is a car in that place and an application was developed which gave information about it and was also used for payment system for that particular area according to the time car will be parked.

Manickam Ramasamy, Sunil Govinda Solanki, Elango Natarajan “IoT Based Smart Parking System for Large Parking Lot”, [5] In this paper author explained about how we can overcome the conventional way of parking with the help of IOT and cloud computing. they have used Arduino mega as a microcontroller to upload information of available parking space . HC-SR to sense the parking slot So occupancy of parking slot is detected by ultrasonic sensor and notifies it Also servomotor opens the barrier at the entry and exit point when a car is detected. if Space is Occupied then the system will update it to cloud.

Vaibhav Hans, Parminder Singh Sethi, Jatin Kinra “An Approach to IoT based Car Parking and Reservation system on Cloud”, [6] In this Paper authors briefly explained about IOT based car parking system and reservation system ,based on cloud. Basically they focused on two different modules first one focuses on current demands of customers and the second one describes organization it basically organizes the space available for upcoming cars and keeps track of it. Also they have made a special wallet feature for payment purpose so No need to wait in queues to pay. Also they created a App through which we can keep track of our vehicle and we can do bookings from it. Cloud factory is used for Storage and parking is allocated when server side script runs.

III. METHODOLOGY

We are using an Arduino UNO for this project, together with IR sensors to monitor the movement of moving vehicles and a 162 LCD to show the parking status.

This system is capable of automatically locating the open, vacant parking spaces. In an automated car parking, if a slot is available, new vehicles may enter; otherwise, if no available space is discovered by the system, the entrance is blocked by a servo barrier. On a 162 LCD, the guests may view the status of the free parking spots outside the parking. By using our LED Display, visitors can clearly observe which slot numbers are open and which are closed.

So, the first IR sensor will recognise the car as it approaches the parking space and send a signal to the servo motor to lift the rod linked to it so that the automobile can enter the space. The second IR sensor will therefore identify when the car has reached the parking area so that the servo motor may return the rod to its original position before the car moves to its designated slot, with the slot number also being displayed on the LCD Display

The above methodology is implemented with the following devices:-

Arduino Uno is a microcontroller board which is based on ATmega328P microcontroller. It consists of 6 analog pins, 14 I/O ports to connect external electronic circuits, out of which 6 can be used for pwm outputs. It is an open-source project and also contains other components such as crystal oscillator, serial communication, voltage regulator etc.



Fig 4.1: Arduino Uno

A servo (or servo motor) is a rotating actuator or linear actuator that allows for perfect control of angular or straight position, velocity, and acceleration. It consists of a suitable motor joined to a sensor for position response. Servo Motors are used in applications such as robotics, machinery, or automated manufacturing.



Fig 4.2: Servo Motor

Next two important used in the project are Infrared Sensor It which is the kind of sensor used for infrared rays to detect or measure surrounding environment and Jumper wires used for connecting.

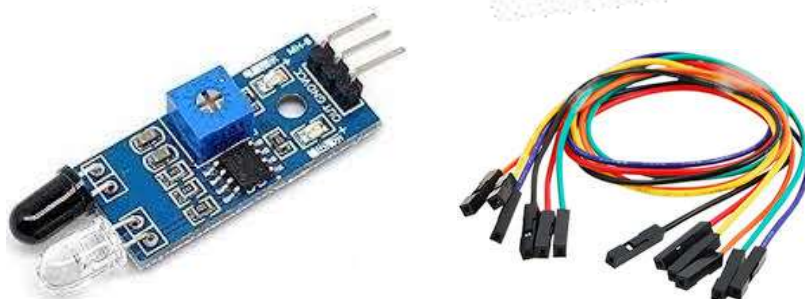


Fig 3.3 Infrared sensor and jumper wires

IV. PROPOSED ARCHITECTURE

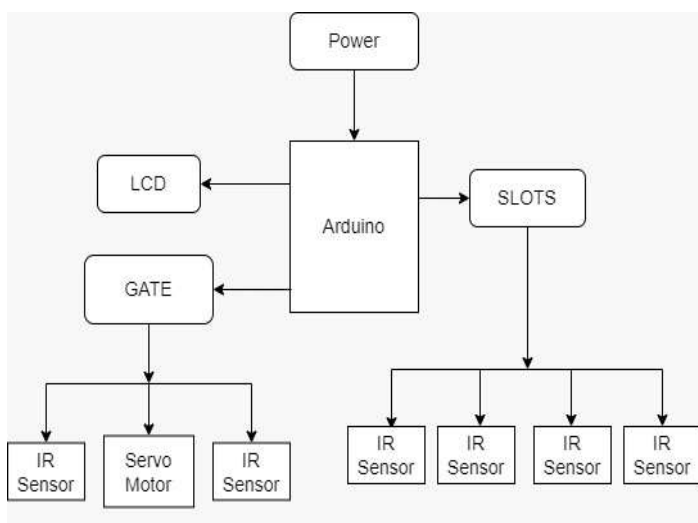


Fig 5: Proposed Architecture

The figure 5 shows the proposed architecture of the project where a arduino is made working using a power source .Connected to it are first an lcd to display all of the results for the user ,a gate which will be a barrier managed by a servo motor to allow the car for coming in along with two infrared sensors to check whether the car has reached near the gate as well as the car has successfully crossed the gate while entering or leaving. Then come the most important part that is the four slots where each slot have ir sensor to manage the presence of a car for confirmation of filling of a slot which is then displayed on the lcd screen to anytime view the numer of filled and the slots that are empty.

V. RESULTS

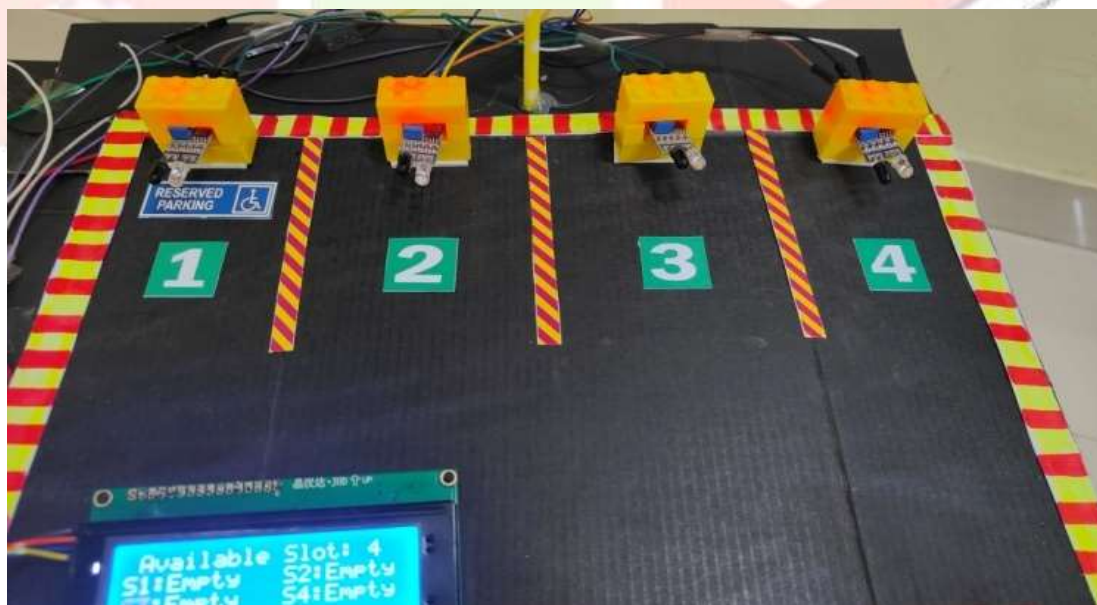


Fig 6.1:Empty Slots

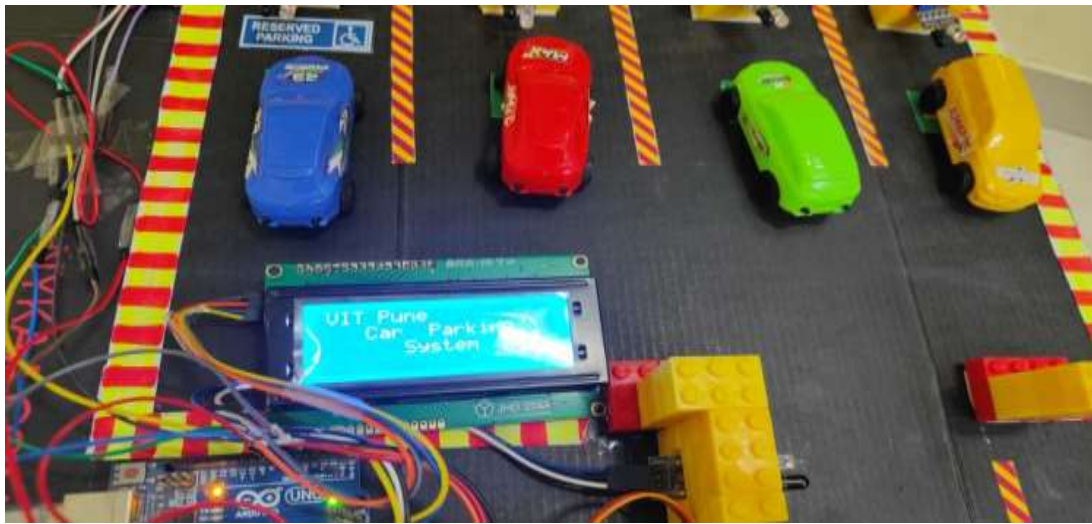


Fig 6.2: Lcd Screen

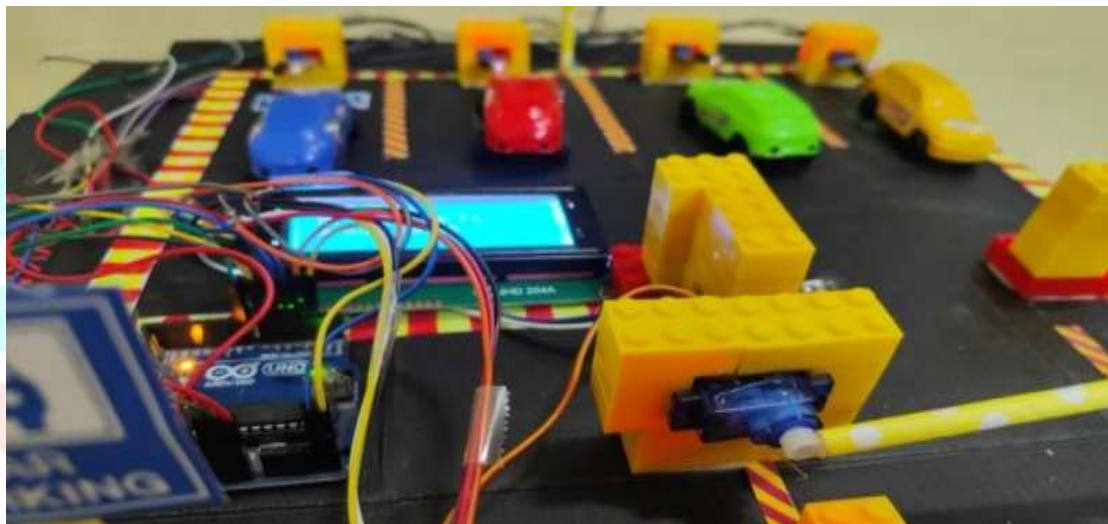


Fig 6.3: Entire Circuit



Fig 6.4: Entry Area

VI. CONSLUSION

A successful real time smart parking system was build for the management of cars in a parking slot and a small prototype was build with 4 parking slots .The handling was done with the help of a servo motor which would act on the boom barrier when a car comes near the barrier an IR sensor senses it and with the code servo motor rotates thus the barrier moves up and car can go inside.At the same time another IR sensor is located on the inner side to confirm an entry of car thus making a slot for it and it is displayed on the screen using an lcd sensor.

In the same way when a car wants to move out the inner IR sensor senses it near and the barrier again moves up using the servo motor and it can go out which is again displayed on the screen and a slot is increased for any other car to come .If there is no slot available then the screen displays appropriate message like the slots are full and no more cars can enter

VII. FUTURE SCOPE

Now,there are many prospects in which the project can be made more advanced and efficient , some of them are:-

One option is that we can manage the entry in a more secured way like some cameras can be installed to keep a track of whether all things are going in proper order or not using an image sensor.

Secondly we can make a website or application in the near future for giving all the details so a user has to just login in the site with proper credentials and then they will be able to see in real time using cloud computation the available and empty slots.

Also along with making some minor changes we can also add more slots in our project in the near future so that the project might be more near to a real life scenario where there are multiple slots for the parking to be useful to a large number of people.

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