

SMART VERTICAL ROTARY CAR PARKING SYSTEM

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ABSTRACT:

In metropolitan cities, vehicle parking has become a major concern in all busy areas and a good traffic system needs a good parking system. Different types of vehicle parking are applied worldwide namely Multi-level Automated Car Parking, Automated Car Parking System, Volkswagen Car Parking, vertical car parking etc. Parallel parking is challenge for all drivers say amateurs or the experts. A multistage car parking system is a solution to this ordeal. This paper explains in detail a simple and precise multistage car-parking introduction, advantages, characteristics, etc. This paper gives the information to develop a reduced working model of a car parking system for parking 6 to 12 cars within a parking area of 32.17 m². The chain and sprocket mechanism are used for driving the parking platform and a one fourth hp brake motor shall be implemented for powering the system and indexing the platform. The platform is fabricated to suit. In Bangladesh, parking system is a huge problem. Sometimes parked cars in the streets creates extra traffic jam and Traffic jam is already a curse in Dhaka city. One lane of a road gets always blocked Because of parking. In Filing Stations cars always creates a line to be refilled and blocks a lane of the road. Parking is a key component of transportation program. The city has addressed parking problems associated with educational institutes, entertainment users, religious institutes, commercial activities, special events etc. All this can be solved by the vertical car parking system, which is a

mechanical device that multiplies parking capacity inside a parking lot. The driver leaves the car inside an entrance area and technology parks the vehicle at a designated area. Hydraulic or mechanical car lifters raise the vehicle to another level for proper storing. We can control the rotation of parking with the Help of IOT (ESP-32 Cam) and also monitor through the Camera.

Keywords: Multilevel Car Parking Arena, IOT, Smart Camera etc.

I.INTRODUCTION:

In this period of time, so many challenges faced by human being regarding to parking system. As we know that our country is developing day by day in the term of technology, industrial factories, buildings & highways etc.

In coming era, almost everyone will have cars & other vehicles. If many peoples will live in colony or apartment so they will need a proper parking slot in very less area.

And also in supermarket areas, mostly peoples park their car on the road side of the lane. It is very huge issue for traffic. Peoples faced many problems because of that.

So reduce this all problems we need to make that type of parking system which required very less area (horizontal space). That is the reason vertical car parking is very useful system to reduce horizontal area.

Vertical car parking is a mechanical system and also use electrical, electronics and programming system that multiplies parking capacity inside a parking lot. Parking systems are generally powered by electric motors or hydraulic pumps that move vehicles into a storage position.

Car parking systems may be traditional or automated. Automatic multi-store automated car park systems are less expensive per parking slot, since they tend to require less building volume and less ground area than a conventional facility with the same capacity.

II.CIRCUIT DIAGRAM:

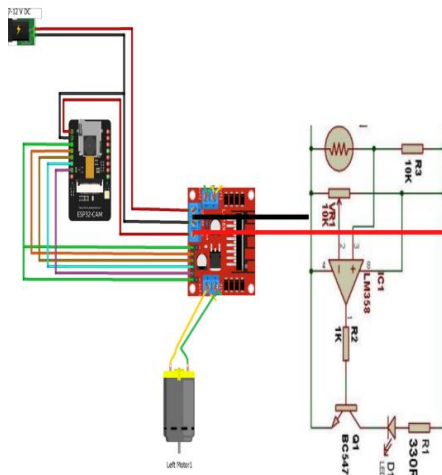


Figure 1. Circuit Diagram

III.PROPOSED LAYOUT

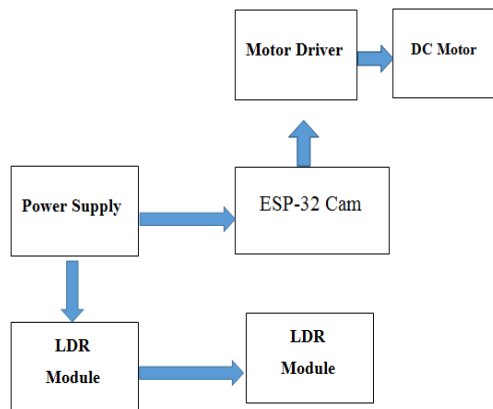


Figure:-2 Block Diagram of VCR

Input 1	Input 2	Output
0	0	STOP
0	1	FORWARD
1	0	REVERSE
1	1	STOP

IV.REQUIREMENT COMPONENT:

a)ESP 32 CAM:

It is like a microcontroller device. It's generate their own hotspot and gave network as internet. There are two inputs to control the rotation of motor.

It works like mention below:



Figure:-3. Pin diagram of ESP32 Cam

b) MOTOR DRIVER:

L298N Motor driver module is that type of device which is used to control the speed of motor like clockwise or anticlockwise.

There are two or more than two motors can be connected with motor driver. And it operate to 5v & 12v of power supply.

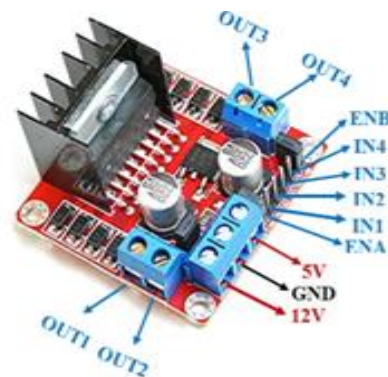


Figure:-4 L298N Motor Driver Module

c) DC GEAR MOTOR:

Gear motor is basically a DC motor which convert energy from electrical to mechanical form.



Figure:-5 DC Gear motor



Figure:-6 Light dependent resistor

And gear motor provides high starting torque.

V.CONCEPT AND OPERATION:

Automated car parking systems use a similar type of technology to that used for mechanical handling. The driver leaves the car inside to scan QR Code and technology parks the vehicle at a designated area. Mechanical car lifters raise the vehicle to another level for proper storing. The vehicle can be transported vertically (up or down) and rotate (clockwise or anticlockwise) to a vacant parking space until the car is needed again. When the vehicle is needed, the process is reversed and the car lifts transport the vehicle back to the same area where the driver left it. In some cases, a turntable may be used to position the car so that the driver can drive away without the need to back up.

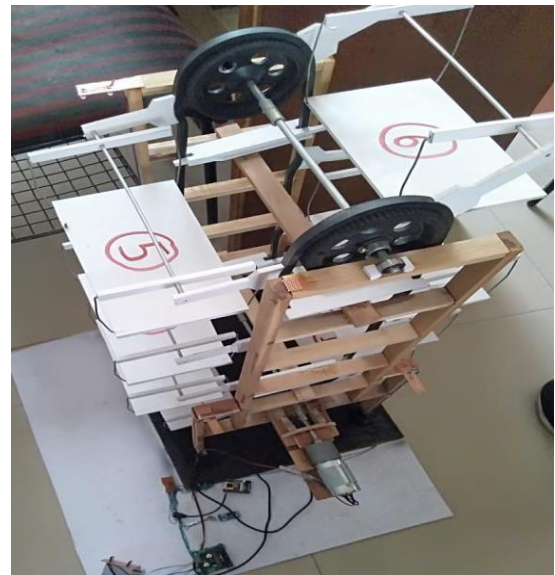


Figure:-7 Vertical car parking

d) LDR:

Light dependent resistors, LDRs or photo resistors are electronic components that are often used in electronic circuit designs where it is necessary to detect the presence or the level of light. so that can easily rotate & smooth operation. operate to 5v & 12v of power supply.

VI.SCOPE OF VCP:

The vertical car parking system based on slot booking is implemented, using the Website and Hotspot. Using the slot allocation method we can book our own cheapest parking slot. It is an efficient one for solving parking problems, which overcomes the traffic congestion also provides automated self-operated. This work could be further extended as a fully automated system using multilayer rotatory parking method. Safety measures such as tracing the vehicle number face recognition of the drivers so as to avoid theft & automatic rotatory parking process can also be designed. We plan to

expand the tests on the real time environment where the users can have the “Vertical Car Parking” system in their handheld devices.

VII.ADVANTAGES:

- **Easy Installation:** No need to spend months building new stories to increase our lot capacity. After the civil work and cabling is done, we can start using digital parking in just 20-25 days.
- **Independent Operation:** The system is designed to work at all times with self-operation. No need to operate by others.
- **Limited Space Required:** Digital parking solutions require only length 10-12ft, height 40-45ft for 12 cars, and a very minor space required.
- **Long Lasting System:** Because of its strong build, if operated correctly, digital parking units can provide us 15-20 years with only minor painting needed to keep up its look.
- **Environment-friendly.**
- **Safety and security.**

VIII.CONCLUSION:

In this paper, we have presented the concept of Vertical Car Parking System which will be able to reduce the traffic congestion which will improve the citizen's facility of life. Android mobile application called Car parking, a driver can find the parking spaces available in a given area and get the parking slot.

A simple vertical car control strategy has been developed and simulated using Witness software with reasonable success. Various variants of the simple baseline strategy. Vertical Car Parking model has been designed; all the parts in it were manufactured and assembled and tested successfully.

Analysis of the model has been done and developed with the scaling of 1:9 for life size model Such as Fortuner like.

As the life cycle model involves proper design and advance methods are to be used to meet the requirements of the customer. Quick Automated Parking and retrieval of vehicles.

Up to 12 cars can be easily and safely parked. Surface space required equivalent to just 2 surface car parking spaces.

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