

Smart Parking System With Anti Noise Pollution

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ABSTRACT

In this paper, we explore the process of the smart parking system and their categories. The classifications of various existing systems are explained. The parking system handles various technologies, and the categories of those techniques are given. The functions of the nodes in wireless sensor networks are classified. Indian Roads are very Noisy due to various road users and congestion factors., its a custom in India to paint Truck Rear with message " BLOW HORN". Honking is a habit and people like to install various types of horn to generate discrete audible noise. With the increase in vehicle production and world population, more and more parking spaces and facilities are required. In this paper a new parking system called Smart Parking System (SPS) is proposed to assist drivers to find vacant spaces in a car park in a shorter time. The parking system handles various technologies, and the categories of those techniques are given. The functions of the nodes in wireless sensor networks are classified. Honking is a habit and people like to install various types of horn to generate discrete audible noise. With the increase in vehicle production and world population, more and more parking spaces and facilities are required. In this paper a new parking system called Smart Parking System (SPS) is proposed to assist drivers to find vacant spaces in a car park in a shorter time.

Keyword: - Parking System ,vehicles, barrier, billing System

1. INTRODUCTION

Now-a-days, as in parking areas also noise pollution is increasing day by day so to decrease the noise pollution and easily finding vacant spots for parking. We are going to use ultra sonic sensor that will help to find vacant space when the car enters in the parking area and also we are going to use a buzzer which will work like horn .There will be limitation for buzzer ,if the buzzer exceeds the limits given there will be a fine applicable to the driver. This will not only lead to happier customers since they can identify a spot faster. A driver will spend less time circling the lot and will not need to be as visually distracted. A smart car parking is essentially a building with number of floors or layers for the cars to be parked. The different levels are accessed through interior or exterior ramps. An automated car parking has mechanized lifts which transport the car to the different levels at a certain position. Therefore, these car parks need less building volume and less ground space and thus save on the cost of the building. This system proves to be useful in reducing wastage of space where more than 100 cars need to be parked. This system enables the parking of vehicles, floor after floor and thus reducing the space used. Here any number of cars can be parked according to the requirement. These makes the systems modernized and even a space-saving one. Smart car parking system is essential especially in regions facing space shortages, also in areas which cater huge crowds. Failing to accommodate the growing number of cars, it has become imperative to come up with more efficient parking solutions. In this regard, smart automated car parking is considered effective in tackling the issue of parking. Smart car parks offer greatest possible flexibility for the realization Manufacturing Engineering, Automatic Control of optimum parking solution. When the car approaches the elevator will work automatically because there is no vacant space on the ground floor and it will proceed to the first floor, if the first floor has empty space to park the car will go to the second floor if the first floor is full. If there is no vacant space on all floors the red light will be on in front of the parking to indicate the driver that there is no empty space to park. In the case, the car is inside floor and

wants car want to go out, the elevator will rise automatically to the floor that contain the car, then go down to the ground to allow the car to go out.

1.1 Advantages of smart car parking system

This system is more versatile and fast automatic Parking system. The advantages of multilevel Parking system are:

- Maximum utilization of ground space.
- Quick entry and exit due to the independent Operation of lifts.
- designed for driver convenience.
- Partial breakdown doesn't affect the other parts.
- Governed by computers.
- Multiple safety guarantee of the drivers and the cars too. - Average vehicle retrieve time is less than 2 Minutes.
- require less building volume and less ground area.

1.2 Disadvantages of smart car parking System

The disadvantages of multi-level car parking system Are:

- Expensive as the whole parking and retrieval operation is multi-level.
 - Any fault in the multi-level car parking system will lead to the great haphazard and inconvenience to the people. - The power consumption is high to run such system.
 - This system is more complex to build.
- Customers have to pay large fares to park their vehicles in multi-level car parking system.

2. EXPERIMENTAL SETUP

In this paper, a symbolic parking system has been designed for car parking comprising three floors, executing the entry and exit of vehicles through elevator which is controlled by (PLC). In order to implement the smart car parking system, one needs to setup and assemble the hardware components and write a program to control the multi-level car parking system. The layout of the multi-level car parking system is displayed in the Figure that shows and explains the major components of DC motor which consists of frame, shaft, bearings, stator, and rotor and brush assembly.



Fig -1 Experiment Related Image

2.1 DC Motor

DC motors have been used in industrial applications for years. Coupled with a DC drive, DC motors provide very precise control. DC motors can be used with conveyors, elevators, and extruders, marine Applications, material handling, paper, plastics, rubber, steel, and textile applications. It is important to understand the electrical Characteristics of the main field windings known as the stator and the rotating windings known as the armature.

Understandings of these two components Will help with the understanding of various Functions of a DC Drive. The relationship of the electrical components of a DC motor is shown in the following illustration. Field windings are mounted on pole pieces to form electromagnets. In smaller DC motors the field may be a permanent magnet. However, in larger DC fields the field is typically an electromagnet. Field windings and pole pieces are bolted to frame. The armature is inserted between the field windings.



Fig -2 Servo Motor

2.3 Ultrasonic Sensor HC-SR-04

It works on ultrasound with the frequency of 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance. The HC-SR04 Ultrasonic Sensor has 4 pins, Ground, +5V, Trigger and Echo. The Ground and the VCC pins of the module needs to be connected to the Ground and the 5 volts pins on the Arduino Board respectively and the trig and echo pins to any Digital I/O pin on the Arduino Board.



Fig -3 Se Ultrasonic Sensor HC-SR-04 rvo Motor

2.4 Entry of the cars thought the main gate

When the car enters in the parking slot the output panel will displays which slots are empty then the driver can see the panel and park the car in that empty slots. If the parking slot is empty only then the car can enter in the parking slot. If the parking slot is full the gate will not open and the car cannot enters in the parking slot.



Fig -4 Entry of the cars through the main gate

2.5 Billing System

In that the input like vehicle number should be given by the customer when they press enter the details will be stored in database... when they press exit button it will recognize the vehicle number and produce bill along with the amount based on the usage. In order to overcome existing system problems new system is developed using this system any system can be easily searched with better security features. Car Parking is a response to this situation and is the deployment of strategic plans and strategies to plan the car parking system efficiently. There are several benefits endowed by automated billing system. The benefits lie in the parking of more cars in save time due to proper planning and reduce traffic, economical aspect as it is cost-efficient, ensured safety of vehicle and the convenience of car parking. The entire process of vehicle parking becomes hassle-free and affordable with automated billing system giving the vehicle owner a respite from the constant tension of car parking. More features are provided in the project document.

2.6 Technical Requirements

Hardware requirement:

- Arduino mega
- LDR, LED
- Ultrasonic Sensor
- Buzzer, Servo motor
- Temperature Sensor
- Bread board
- Button for buzzer.

Software requirement:

- Software required Arduino IDE.

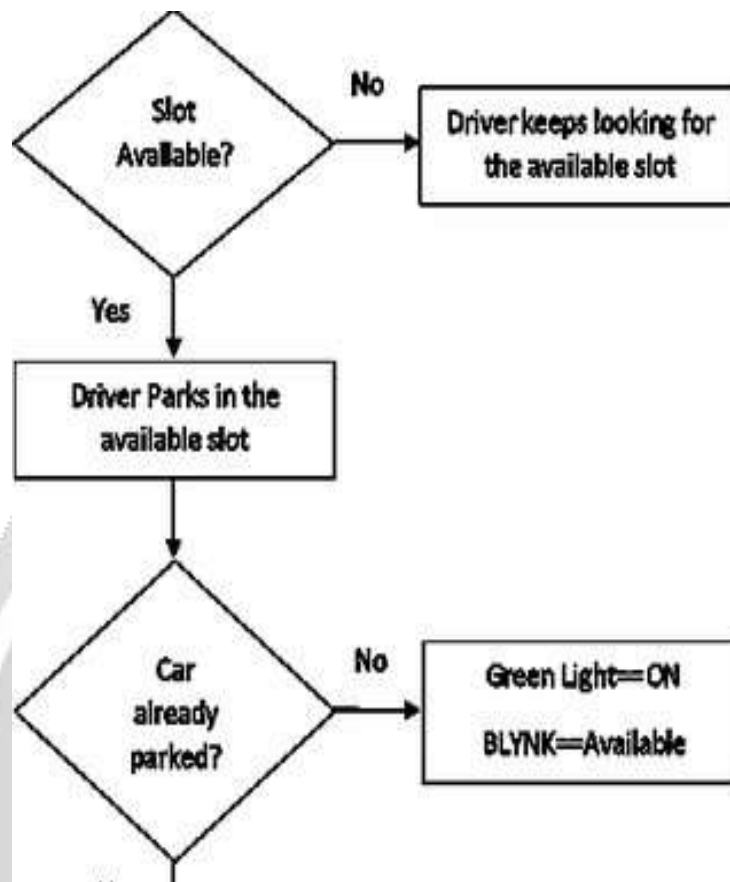


Fig -5 Block Diagram

3. IMPLEMENTATION

Process of lining up the cars on all the three floors begins as soon as the first car arrives at the main gate. There is a pair of indicating lights; the green one indicate the availability of the vacant place in general, whereas, the red one indicates the non Availability of the any vacant place anywhere all the three floors and will prohibit the entry of any car to the park. At the first state the system adopts the following sequence of the instructions on the entry of a car:

1-On the arrival of a car at a particular entry point, the sensor on the elevator sends signal to the system informing about the existence of the car whereupon the control system instructs the elevator about the Suitable floor according the availability of any vacant place.

2- After the arrival of the elevator at the proper floor, the car directly enters and the sensor at the gate sends the signal to the control system to on firm the entry and the system will determine the number of entered cars. In case of the stoppage of the elevator in front of the first or second floor, the control system will guide the car about the exit of cars from the previous two floors.

3- In case of exit, the car stands before the sensor, which on turn gives signal to the control system about the existence of the car waiting for exit, and the exit process depends upon the priority of the availability of the elevator. For example; on the stoppage of the elevator in front of the ground floor the priority would be for the leaving cars.

On the other two floors, priority for the exiting cars will Depend upon firstly on space available on the elevator, and secondly on time required for exist.

4- The system will establish the number of cars on All the three requiring entry and exist depending on the signals of the sensor on each floor. D

5-Depending upon the difference between the car in and cars out the control system will instruct the elevator about the suitable floor.

6-Each floor has the warning lights indicating the state of the parking. For example the green light indicated the availability and the red light indicates The non-availability of the parking place.

4. CONCLUSION

The smart car parking system had successfully been designed and developed. The control strategy for the traffic flow to the smart car parking system was carried out using the PLC. The PLC with the help of some sensors checks the availability of the vacant place on each floor. It can be noticed that the control system for the multi-level car parking system has achieved the anticipated performance to regulate the entry and exit of the car to/from several floors accurately. The movement of the elevator between the floors was continuous and smooth as requested. The number of entering and existing car from all the three floors was controlled as per the signals from the sensors on each floor at the entry and exit point. The entry and exist phases of the cars depends on the availability of the elevator and the time required for exist. The preference for the entry will be for the car that is present at the stopping in front of an elevator at the. Meanwhile, the preference for exist from other floors will depend firstly on the space and secondly on the time demanded for exist.

5. LITERATURE SURVEY

The results of the study showed that annoyance was largely determined by noise disturbance and perceived noisiness. Personal noise sensitivity, attitudes towards different means of transport and perceived quality of the living environment were the secondary contributing factors. Paunović Katarina et al. (2009) conducted a study to assess the predictive value of various factors on noise annoyance in noisy and quiet urban streets. Equivalent noise levels [Leq (dBA)] were measured during day, evening and night times at all of the streets of a central Belgrade municipality. Based on 24-hour noise levels, the streets were denoted as noisy (24-hour Leq over 65 dBA), or quiet (24-hour Leq under 55 dBA). A cross-sectional study was performed on 1954 adult residents (768 men and 1186 women), aged 18–80 years. Noise annoyance was estimated using a self-report five-graded scale.

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