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AUTOMATIC CAR PARKING

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ABSTRACT

Now a day's vehicle parking is an important issue and day by day its necessity is increasing. In Bangladesh we are still using the manual vehicle parking system and that is why we are facing problems like wastage of time and fuel finding free space around the parking ground when we need to park our car which requires a good amount of lighting. Another issue is chaos that happens while parking because there is no particular system anyone can park anywhere that sometime causes damage to the vehicles while moving out or in the parking lot. Security is also an issue there. To solve these problems we are introducing new car parking system. The system works as follows: The driver will place the vehicle in front of the garage door and there will be a monitor available where the number of available parking slots will be displayed. The user will have to provide his mobile phone number and car's registration number and the operator will give command to open the gate, a car parking tray will come & will park the car in the garage. The user will receive a SMS which will contain a code. After the car is parked a time counter will count the amount of money to be deducted till the car is parked out. While parking out the driver will have to provide the code to the operator at the exit gate. The user will receive a SMS stating the amount to be paid. After paying the amount the car parking tray will park out the car using the same process it was parked out.

KEYWORDS : Car Parking, SMS, Traffic, Automated Parking

1. INTRODUCTION

Over the decades our country has been developed drastically, now we are in this state that we have a lot of well contacted roads, commercial building and increasing number of automobiles. While parking these automobiles in parking space we use the manual procedure of parking. Which most of the cases is unplanned and lack of discipline due to this, people can park their cars anywhere they want to, which creates a mess as people do not follow the particular cue most of the time. As a result of this, a huge traffic jam takes place in that place. While parking in and retrieving car due mismanagement cars can get dent by bumping with each other as there is lack of sufficient space. This leads to arguments, fights among people which sometimes make huge traffic jam. This is also an economical loss as we need to repair our damaged car and also cars consume extra fuel while parking in or out. Traffic jam is an issue here as it kills our precious time. Due to this chaos in parking our valuable time gets wasted. It harms the students, office going staffs and emergency patients to a great extent [1].

It also causes economical loss to commercial places like shopping malls, amusement parks as people are more likely not to visit these places due to this parking hazard. As we are advancing with time, the manual car parking system in commercial spaces is creating hurdle which is causing wastage of time and some economic losses as well. Therefore we need a solution which can overcome these problems. Here we are introducing Automated Parking Systems as a solution of these problems as well ascar parking system in commercial spaces is creating hurdle which is causing wastage of time and some economical losses as well. Therefore we need a solution which can overcome these problems. Here we are introducing Automated Car Parking Systems as a solution of these problems as well as a replacement to the manual car parking systems at commercial spaces. This system not only saves time and money, it can also earn money by charging for parking spaces [2].

2. LITERATURE REVIEW

steering wheel, accelerator pedal and brake pedal need to be completed by drivers. The latter is automatically controlled. Automatic parking system can intelligently control steering wheel to complete parking operations through the environmental information collected by sensors. Sensor technology of parking assist system is the foundation for the development of automatic parking system. Many specific commercial applications of typical parking system can be described as follows. Citroen was assembled a parking assist system-City Park on the C3 in Sina (2005).

The system is used for parallel parking. It requires the parking speed below 25 km/h. Through the built-in three ultrasonic sensors in the front and rear bumpers, it can detect distance and parking space. When the space is not enough, the system sounds to warn the driver. When the space is sufficient, the reverse gear is engaged. The steering wheel is automatically controlled, and the vehicle is driven forward and back to park. A parking assist system "Park4U" developed by Valeo (2008)

A French automotive parts manufacturer, is applied to Touran parallel parking situation. It relies on many ultrasonic sensors of car body to scan both sides of the road and measure the length of parking space. When the sye is an ample parking space, it advises the motorist through indicators. The motorist continues moving 1 the system prompts "starting position", then letting go of the steering wheel, just controlling the speed and brake to park the car. In 2007, the top sedan LS series of Toyota's luxury brand Lexus series was installed a smart parking assist-IPA w.wang (Intelligent Parking) (2009)

The system uses electric power steering (EPS). During parking process, the steering wheel can be automatically controlled to complete the operation of parking. This set of the IPA system uses ultrasonic sensors to detect the parking position, and can be combined with cameras to identify the parking line. When passing by or near the parking position, the car automatically detects the parking location and distance, and mark the parking location with lines on its display. Subsequently the driver simply confirms and engages the reverse gear to start the IPA system. The steering wheel can be automatically controlled for parking. During this process, the ultrasound detection system is used to avoid collision until the parking H. deng(2011)

3. APPLICABILITY OF OUR PROJECT

Over the decades with the development of our country we've reached in a situation where the manual car parking system in commercial spaces needs to be replaced [3,4]. The manual car parking system is causing hurdle and chaos in parking space, therefore resulting in wastage of time and some economic losses as well. Therefore introducing Automated Car Parking Systems in commercial spaces can be replacement to the manual car parking systems at commercial spaces. We can install this system in the places like:

3.1 OFFICE BUILDINGS:

It will help the staff to park their car without any hurdle and wastage of time. It will also relieve their mind from the unnecessary parking hurdle. Also if someone is already late he wouldn't be late any further by having to search for the parking space and park his car. It will also provide security to their cars from stealing.

3.2 HOSPITALS:

In hospital when there are a lot of emergency cases there are a lot of a cars and ambulances coming in the parking space. This creates jam which cause delay for the patients to receive the medical services, which often can be fatal to them. If we install the automated system, it will take less time to park car and the patients to reach the medical services. Also they can earn revenue for cars other than the ambulances. It will also provide security to their cars from stealing.

3.3 AMUSEMENT PARKS:

If we install automated car parking systems in amusement parks it will attract more people to come to these places. The more the people will come the more revenue will be earned. Moreover these amusement parks relieve us from our dull and monotonous lives, refreshes our mind. The more people can enjoy these places due to the advanced parking facility. It again increases the revenue as people need to pay for parking their cars. It will also provide security to their cars from stealing.

4. CALCULATION

Initially: Count = n; allocated slot = 0; Number of slot = a;
Stopwatch no = allocated slot;
Stopwatch value (n) = elapsed time; price of slot (n) = Stopwatch value*price per unit;
Time to reach the 1st slot from entrance = m; distanceA = n*m;
distanceB = o*n;
Time to reach the last slot from exit = o; distance1 = n+ distanceA; distance2 = n+ distanceB;
After every input:
allocated slot = allocated slot + 1; n = n+1;

5. Prototype Mechanism, Algorithm And Flowchart

The Automated Car Parking System is made up with 3 major components: Arduino Uno R3, GSM Module and RF Module. The core part of this system is the microcontroller in Arduino R3. The coding of this system has been done using ArduinoIDE programming language. The LCD display will display the number of available slots and price it will have a RF Receiver Module to get updates about the parking When a car will come, the operator will send instruction through arduino to open the gate using RF Transmitter Module and update the LCD display at the entrance. DC motor helps the gate to open up when it gets the signal from arduino, arduino will only get the signal to DC motor using RF Receiver Module. The operator will send a SMS containing a code to the user's mobile phone using arduino& GSM Module. The stopwatch will be started as soon as the gate opened. This code will be saved in the system against a slot which will be sent to the car parking tray using RF Transmitter Module. The car parking tray will also be called by using RF Receiver Module &arduino. The car parking tray will park the car & will come out to park the next car. The wheels of the car parking tray will be controlled by arduino so that it reaches the particular slot. For parking out the user will have to give the provided code to the operator at the exit gate. The user will receive a SMS stating the amount to pay for the parking again by using arduino& GSM Module. After the user makes payment the operator will give command to park out the car. The operator will update the slot information to the LCD display at the entrance using RF Transmitter Module. The car will be parked out the same way it was parked in.

5.1 FLOWCHART:

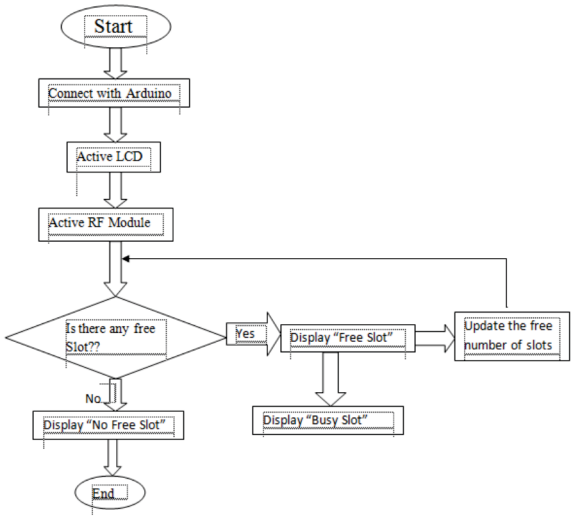

FIG. FLOWCHART FOR THE DISPLAY

REFERENCES:

1. D.J. Bonde, Rohit Sunil Shende, Akash Sambhaji Kedari, Ketan Suresh Gaikwad and Amol Uday Bokre, "Automated Car parking system commanded by androidapplication"
2. Mohammed Y Aalsalem, Wazir Zada Khan and Khalid Mohammed Dhabba, "An automated vehicle parking management and monitoring system using ANPR cameras
3. M. M. Rashid , A. Musa, M. Ataur Rahman and N. Farhana, A. Farhana, "automatic parking management system and parking fee collection based on number plate recognition"
4. Vanessa W.S. Tang, Yuan Zheng and Jiannong Cao, "An intelligent car management system based on wireless sensor networks