AUTOMATIC CAR PARKING SYSTEM

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Abstract

Due to the proliferation in the number of vehicles on the road, traffic problems are bound to exist. This is due to the fact that the current transportation infrastructure and car park facility developed are unable to cope with the influx of vehicles on the road. To alleviate the aforementioned problems, the smart parking system has been developed. This is an application based on Internet of Things (IoT) that in Real-Time environment have sensors and devices embedded into parking spaces, transmitting data on the occupancy status; and the vehicle drivers can search for parking availability using their mobile phones or any infotainment system that is attached to the vehicle. Hence the driver would know where there is an available spot to park his vehicle in less time, reducing the energy consumption and air pollution.
The Client or the sensor posts the parking slot occupancy status to a web service URL. The Java based web service is built using Spring and Hibernate to connect to the backend system. The web service (.war) file is deployed on Apache Tomcat Server and the backend used is MySQL database.

**Key Words**: Android Application, Automated Parking System.

1 **Introduction**

In the project Car Parking System we have shown the concept of an automatic car parking system. As in the modern world everything is going automatic we have built a system which will automatically sense the entry and exit of cars through the gate and then display the number of cars in the parking lot. Even we can set a maximum capacity of cars with the help of user interface given in the hardware in the form of switches so that there is no congestion. We have deployed a microcontroller which is used to sense the movement of cars and depending upon whether there is a capacity of cars to enter, it either Free space is there or not. It is also possible to free space when any car enters in the parking lot or close the door when a car exits from the parking lot. The sensing of entry and exit of cars is done with the help of Infrared transmitters and receivers. Before the door the Infrared transmitter is mounted on one side and the receiver is placed directly in front of the transmitter across the door. When a car arrives the Infrared beam is blocked by the car and the receiver is devoid of Infrared rays and its output changes. This change in output is sensed by the microcontroller and accordingly it increments the count and opens the door if there is some capacity. The procedure for the exit of the cars is similar as the entry.

2 **EXISTING METHOD**

The use of vehicles increases in the proportion of the population. Due to the traffic congestion, the accidents are also increasing day by day. This causes the loss of life due to the delay in the arrival of ambulance to the accident spot or from the accident spot to...
the hospital. So, it is necessary to take the accident victim to the hospital as soon as possible. Whenever, the accident is occurred, it has to be informed to the investigation unit. So, it is also beneficial if the intimation is reached to the enquiry section so that the time for the investigation can be minimized.

3 RELATED WORK

Various methods are present for development of intelligent parking systems. Many of the existing systems require a little or more human intervention for the functioning. One of the intelligent systems for car parking has been proposed by making use of Image processing [2]. In this system, a brown rounded image on the parking slot is captured and processed to detect the free parking slot. The information about the currently available parking slots is displayed on the 7-segment display. A vision based car parking system [3] is developed which uses two types of images (positive and negative) to detect free parking slot. In this method, the object classifier detects the required object within the input. Positive images contain the images of cars from various angles. Negative images do not contain any cars in them. The co-ordinates of parking lots specified are used as input to detect the presence of cars in the region. However, limitations may occur with this system with respect to the type of camera used. Also, the co-ordinate system used selects specific parking locations and thus camera has to be at a fixed location. Limited set of positive and negative images may impose limitations on the system. Smart Parking system [4] designed proposed a mechanical model with an image processing facility. The car would be parked with the use of lift at multiple levels. Also, image processing is used to capture the number plate and store in database for comparison to avoid illegal car entry. Thus, in this paper a car parking system is proposed that is a fully automated model with minimum human intervention. It also overcomes the limitations of existing systems.
4 PROPOSED WORK

The proposed application is based on the client-server architecture. The client is provided with an interactive Android based user interface for the process of pre-booking of parking slot. The server side processing will be enabled using Java and MySQL. The client pre-books a parking slot by giving his/her vehicle number. At server side, that particular slot is reserved and a buffer time is set for that particular client. The buffer time is the time that client will require to reach to the parking slot from his/her current location. If the client does not reach the parking area in estimated time then server removes the reservation from that slot.

GPS

The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver. In addition to GPS other systems are in use or under development. The Russian Global Navigation Satellite System (GLONASS) is for use by the Russian military. There are also the planned Chinese Compass navigation system and Galileo positioning system of the European Union (EU). GPS was created and realized by the U.S. Department of Defense (DOD) and was originally run with 24 satellites. It was established in 1973 to overcome the limitation.

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**Diagram:**

- Parking Owner
- Application Server
- Database
- Internet
- Android Drives
- Server

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Fig1: Architecture Diagram

**METHODOLGY**
- Sensors data acquisition
- Data transmission
- Data processing and decision making
- Localhost with user interface

**BORDER DETECTION MODULE**
Here the GPS determines location of the boat and compares it with the pre-defined border value. When it reaches the unsafe area, the message is displayed to the fishermen’s boat.

**BUZZER ALARM**
The GSM module stores the GPS values in the cloud. This sends the GPS value to the controller room through cloud. The particular layer level i.e. border can be predefined and this can be stored in cloud memory. The current value is compared with predefined values and if these values are same, immediately the particular operation will be done i.e, the microcontroller gives instruction to the alarm the buzzer.

**POWERSUPPLY**
Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

5 **RESULTANDANALYSIS**
The software testing process commences once the program is created and the documentation and related data structures are designed. Software testing is essential for correcting errors.
6 Conclusion

The various types of smart parking system and has been presented. From the various examples of the implementation of the smart parking system being presented, its efficiency in alleviating the traffic problem that arises especially in the city area where traffic congestion and the insufficient parking spaces are undeniable. It does so by directing patrons and optimizing the use of parking spaces. With the study on all the sensor technologies used in detecting vehicles, which are one of the most crucial parts of the smart parking system, the pros and cons of each sensor technologies can be analyzed. Although, there are certain disadvantages in the implementation of visual based system in vehicle detection as described earlier, the advantages far outweighs its disadvantages.
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