**AUTOMATED VEHICLE PARKING SYSTEM AND UNAUTHORIZED PARKING DETECTOR**

**ABSTRACT**

In this modern world, with the rapid growth of population vehicle traffic has become a part of our day to day life. Moreover, unauthorized vehicle has also increased. Thus our proposed system aims to ensure proper management of vehicles in the public places such as educational institute, office etc in order to prevent unauthorized vehicle parking and traffic. The features include detection of permitted and non-permitted vehicles on the main gate, detection of unauthorized vehicle parking in the restricted zone thus sending SMS to the authority to take action and taking fine from the vehicle user. Parking charge is also taken from the parked vehicles inside the parking lot before they leave. There are also parking lights which will be lit whenever a car enters a specific parking lot.

**INTRODUCTION**

In this new era, everywhere we can see that modern technology has changed the way of living. With proper use of technology, it is possible to build a world where everything can be accomplished more easily with the help of technology. Vehicle parking management requires automation like any other field to ensure security and comfort. With the vast growth of population and increasing amount of vehicles it has become difficult to find sufficient space for vehicle parking in public places. This does not only waste our energy but also we lose our valuable time. Thus, the concept of automated vehicle parking system and unauthorized parking detector has been a necessity for a while. The main motivation behind the project was to maintain security of the parking area and reduce system loss in parking lot. The project aims to make an automated parking system which helps to restrict unauthorized vehicle parking in the restricted area and generates fine if a vehicle is parked violating the rules by sending an SMS to the registered owner of the vehicle. The authorized vehicles are identified with the help of a registration process which is integrated with the system. Whenever a car tries to enter into the restricted zone, it can be verified if it is already registered and authorized. If it is found to be authorized, then it will be allowed to enter into the restricted area. Again inside the restricted area, there is a parking space with a limited capacity. If the capacity is yet to be full, then the car entering the area will be allowed to park. If it is full, then that car will be given five minutes time to drop or pick the passenger and leave. Otherwise its owner will be charged with a pre-allocated fine as late fee. There will also be a system of parking charges in an hourly basis. The sensors inside the parking space will show the unoccupied space available for parking. It is hoped that this project may have a great impact in making lives easier and contribute in building smart cities.

EXISTING SYSTEM

The need for vehicle parking place in urban areas is increasing day by day. The need to get a secured parking lot and get it reserved before reaching there is more than before. Many research works have been conducted in this sector. One module shows the layout animation of the parking lot status and the other module is made to reserve a parking space through sms. In some other studies, parking lot status is made visible using LED lights. Harishraghav et al. used IR sensor modules for the LED to light up. Again, in another study, a smart phone based parking system that detects if there is a parking spot vacant [14]. Another study shows that cars’ drivers are given the accurate information about location and availability of car parking spots . In some studies, a research has been conducted about wireless sensor technology providing advanced features like remote parking monitoring, automated guidance and parking reservation mechanism. In another study , wireless sensor networks can monitor the state of every parking space by deploying a magnetic sensor node on the space. In a study, an android based system is made that regulates the number of cars to be parked on the designated parking area by automating parking and exiting the parking area. In another study, a two module system have been discussed where one is identification of visitors and the other is parking slot status checking. Another study talks about a car alarm getting activated with the owner getting notified by sms using GSM technology.

EXISTING SYSTEM DISADVANTAGE

* It doesn’t have feature of parking protection.
* It will not control the parking light.
* It is not cost effective.
* It requires more man to monitoring the parking lot.

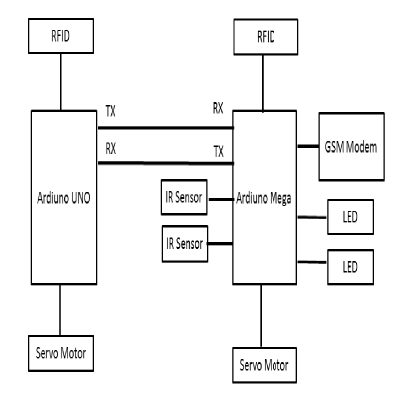
PROPOSED SYSTEM

The system consists of RFID module, GSM modem, Infrared Sensor module, Servo motor, Arduino UNO, Arduino Mega. The system architecture is shown in the figure 1. The entire RFID system consists of RFID tags, two RFID modules and two RFID Reader each at the entry point and exit point. The RFID reader is connected to RFID module. The RFID tags are read by the RFID reader to determine whether the RFID tag number matches with any of the RFID numbers of the registered vehicles. The RFID at the entry point helps to determine entry time for a specific vehicle and the one at the exit point is used to determine the parking charge for that vehicle depending on the time of exit. The RFID used for entry is connected to Arduino Mega and the one that is used for exit is connected to Arduino UNO. The GSM modem is used for SMS generation for unauthorized parking. It is a specialized type of modem which accepts. a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. The servo motor is used for controlling the parking gate. The IR Sensors helps to detect the presence of the vehicle in the parking lots. The LED lights turns on whenever a vehicle is detected in the parking lot. Also these lights get on whenever a registered vehicle is identified at the entrance otherwise they remain off. The overall functionality of the system, according to the top view of the model in figure 2, is as follows. Whenever there is a vehicle at the entry point which is not registered, all the information related to the vehicle is checked to find if the information is valid or not. If the information is valid then it is sent to the server. In case of already registered vehicle, vehicles RFID card is detected and the validity of RFID information is checked. If the RFID is valid then the vehicle can check in. After the vehicle is checked in, the time of entry is stored. When the vehicle is about to check out from the parking zone, its bill is generated and then the vehicle is allowed to exit. The system is made in some parts where some work is done in an individual part. That means that the modules used are interfaced using different Arduino.

PROPOSED ADVANTAGE

* It will automatically detect the vehicle is authorized or not authorized.
* It will automatically send alert if unauthorized car will enter.
* It will detect the car and control the light.

BLOCK DIAGRAM



HARDWARE REQUIREMENT

* Arduino
* Servo
* RFID
* LED
* LDR
* GSM/GPRS

SOFTWARE REQUIREMENT

* Arduino IDE