

# SMART SOLUTION FOR AUTOMATIC PARKING SYSTEM USING IMAGE PROCESSING TECHNIQUE

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**Abstract** - This paper aims to current a smart parking solution for automatic parking system using Image Processing Techniques. Camera can be used as a sensor. The proposed System can capture the circles which are plot at parking slot and containing the information of free car's parking space. In this project Camera is acting as sensors so it can take the image that are under process show occupancy of car parks also free parking slots. By having its image, the pointing car park empty space can be known rather than wasting time and wasting fuel to find one this proposed system been developed in both software and hardware platforms. This automatic parking system makes the whole process of parking cars more efficient and less complex for both drivers and administrators.

**Key Words:** Image processing, camera, sensors, parking slot, automatic parking etc

## 1. INTRODUCTION

Today's most car's park ran to for parks operate efficient. This project implies that are in busy days most of drivers can ride car a fairly long time car by hitchhiking, by having in mind an ultimate goal for finding a parking space. The introduction of in my plan will take people solve the problem of growing traffic congestion, waste of time, as well as spend money and help to provide good open services, less emission and pollution of vehicles, improve city traffic, increase the use of parking and also prevent unnecessary investments.

The automatic parking system, this system can accomplished through sensor hear camera can work as sensor at the park entrance and also as exit, computer system can manage the entire process and various show panel and lights that can help the driver to park the vehicle. There are many systems to detect cars in the parking slots such as magnetic sensor, microwave radars, ultrasonic sensor, and image processing. In our system the area can scanned by cameras to identify easily and easily changed. There are two ways to use the system, there might be either by applying boulder detection and boulder condition methods to detecting the image detection model or by using the canny operator technique to apply point detection. In our project parking slot this project uses MATLAB software

stage. Two types of parking photos will be using. At first is one will be the Google earth and the another will be the real photo of the parking slot.

## 2. Problem Statement

The "Automatic Parking System" provides a remote facility to a users to find a parking slot for a vehicle. Finding a parking lot in most of the metro cities is a tedious job which consumes lot of time and wastage of fuel.

## 3. Methodology

This section is represents the process of maintaining the appearance of the car slot particular point of the car from the photo of a large parking space/slots. There are two ways do develop this project. Apply detection points using the canny operator method or apply border detection with the limit condition of the image identification block it is an independable factor to identify the cars in a parking lot. It is to configure of the image template and the avant-garde image. The purpose of this project is to discover if there are cars in the position of single to all parks.

## 4. Problem Definition

### 4.1 Existing System

In existing system there were trouble of finding an empty space, if not might be UN-imaginable, is very troublesome to get faster find a empty space in a multistory parking slot specially on weekends or public occasions. The exploring space on weekends or on open space it may take long time around 10 minutes, approximately 665 of guests, stadium or also in shopping malls are even crowded during the peak periods, and also finding more trouble in these areas is a matter of concern to customers. Insufficient parking space activity might blocked the driver.

### 4.2 Proposed System

The proposed system comprises two different subsystems

4.2.1 Online system

4.2.2 Offline system

#### 4.2.1 Online System

In this system we provide the facility to the user to park their vehicles within minimum time which will directly help to save the fuel cost and time. First of all user need to register itself on mobile application through the mobile number. Then application will shows the nearby parking areas within specific range by using GPS system. Then user choose the appropriate parking area for their vehicles, that time system will give some buffer time to the user for reaching to that particular parking area. The OTP is generated to verify the valid user and the OTP will remain valid for the specific time. when the user reach on the gate then the vendor will verify the user through OTP, if OTP is found valid then vendor allocate the parking slot to the user else for invalid user the parking slot will be not allocated. The vendor will receive the continuous status about the parking slot which will be detected by using sensors through the sensor based detection system. Another system is designed for the user who do not have smart phones and active internet connection. In the offline system user need to send the specific formatted message to the particular number then he will receive parking areas near by the user according to their rating.

Google location service this will provide a GUI using GPS and Google map display to user's mobile screen through which the user can find the nearby parking areas and proceed for reserving a parking slot. Application server through this server user interacts with the system through internet, this server provides the parking details and also their available parking slots. Server database this is the mail central database server where all the information about parking areas, available parking slots, reserved slots etc is stored and also updated simultaneously. User will interact with this server through internet and the information will be automatically updated to the selected vendor server. Parking owner this is the owner(vendor) side where allocation and DE-allocation of the parking slot is done and updates are provided to central database. The continuous serial communication is done through sensors for continuous updates. Hardware communication the ultrasonic sensors are connected to vendor server through PIC micro-controller which allows continuous monitoring of the parking slot and provide updates instantly to vendor.

#### 4.2.1 Offline System

This system will also come up with offline facility which is irrespective of anyone registration required. The user needs only to type a specific formatted message into the message box and send it to a provided number. Then server gives the feedback to user about the parking space details with respective address provided by the user.

The method of locating of a parking location is based on the photo is to designed and is to be tested with various scenarios need to connect to the parking lot. The technique

for breaking down an airborne perspective of the auto stop has been exhibited well ordered. This involves a coordinates of a parking lot, using an automatic acquisition of photos, and converting the photo to black and white for analysis simple and eliminating noise furthermore, deciding if auto park's empty or filled. The current limitation in this document is weather condition which is to be improved by the filtering the photo with high quality transformation, so for that the capture location of the park's under any weather conditions.

### 5. System Requirements

There are two(2) types of system requirement specification and those are

- 5.1 Software Requirements
- 5.2 Hardware Requirements

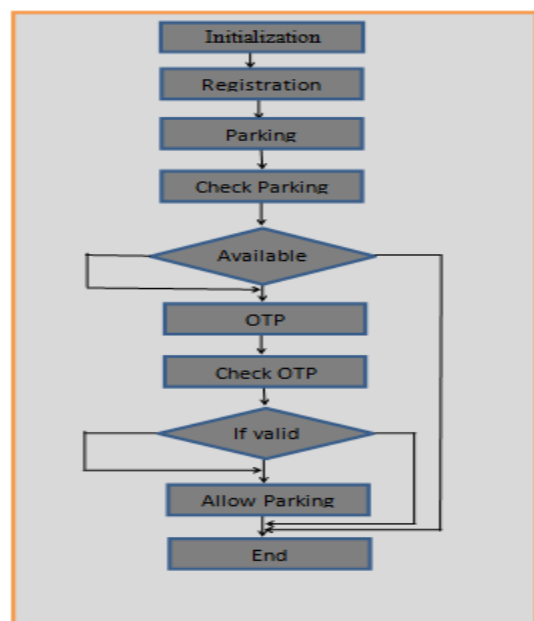
#### 5.1 Software Requirements

1. Operating system: WINDOWS XP/7/8/10
2. Tool used : MATLAB
3. Database : MYSQL

#### 5.2 Hardware Requirements

1. Processor : Intel i3
2. Speed : 1.1 GHz
3. RAM : 2 GB (Minimum)
4. Disk space : 2 GB (Minimum)
5. Monitor, Keyboard, Mouse

### 6. System Design



**Fig -1:** Working of automatic parking system

## 6.1 Modules Description

The system is developed as 5 modules to handle the following parts

### 6.1.1 User Registration

This module registers to the user by entering all his details with the users two or four wheeler details.

### 6.1.2 Send Message

User send message to the admin that the user require parking slot in particular area by specifying his/her details.

### 6.1.3 Capture Image

This system captures the parking slot image and checks which is vacant.

### 6.1.4 Book Parking

Based on user SMS the admin registers the parking slot. And sends message to the user that the slot is booked.

### 6.1.5 Area Parking

This module stores the area wise parking details.

## 7. CONCLUSION

An picture based techniques for recognizing the accessibility of an car stop was modeled furthermore, tried with various inhabitable situations of car's stop. The technique for examining an ethereal perspective of the auto stop has been exhibited well ordered. This comprises of discovering auto stop facilitates from a vacant auto stop, gaining a picture with autos, changing over the picture to high contrast for straightforward examination, evacuating clamor and deciding if auto parks are empty or filled. The present restriction in this task is the precise test perusing brings about couple of blunders which we would like to overcome in future.

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