

# INTELLIGENT CAR PARKING SYSTEM

Snehal Sannake<sup>1</sup>, Mayur Valkunde<sup>2</sup>, Vijay Valsangkar<sup>3</sup>, Karan Patil<sup>4</sup>, Prof. Nitin Sambre<sup>5</sup>

<sup>1,2,3,4</sup>Student Department of Electronics and Telecommunication Engineering, KIT's College of Engineering, Kolhapur

<sup>5</sup>Associate Professor Department of Electronics and Telecommunication Engineering, KIT's College of Engineering, Kolhapur

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**Abstract** - The main responsibility of the Intelligent Parking System (IPS) is to help the user to find an area where parking is available and total number of slots free in that area. Thus our proposed methodology reduces the user's effort and time of searching a parking slot.

Key words: **intelligent, parking, OTP, ATmega**

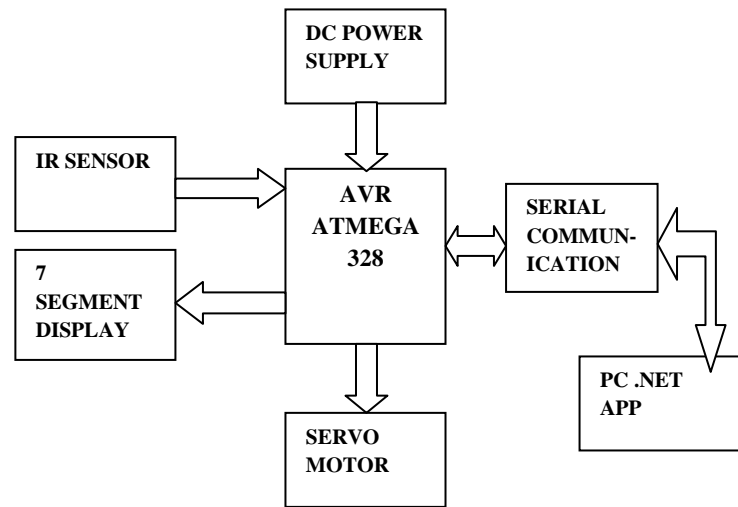
## 1. INTRODUCTION

In the project "Intelligent 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 IR sensors and then display the no of cars with the help of user interface given in the hardware in the form of seven segment so that there is no congestion. We have deployed a atmega328 which is used to sense the movement of cars depending upon whether there is a capacity of cars to enter it either opens the gate or not.

There are 9sets of sensors which is set on the parking area. When a car arrives at the gate the user can enter there vehicle no and mobile no onto the PC. Which means we are designed one software application by using microsoft visual studio2010 software. For making this application we are used c sharp language. Once user can enter mobile no and vehicle no onto PC the user can get one OTP(one time password)onto the entered mobile no. Then user enter this otp on the PC .once otp is matched then user can park there vehicle on the paking area. Same process is done during the exit time. simultaneously it will also display the number of cars present in the parking lot on a seven segment.

The sensing of entry and exit of cars is done with the help of infrared transmitter and receiver module. when a car arrives in front of sensor 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 controller and accordingly it increment and decrement the count.

## 2. BLOCK DIAGRAM



Seven Segment Display:



In this project we are used seven segment display for displaying the total no of available parking slot in the parking area. This is the most basic electronic display device that can display digit from 0-9.

ATmega 328:



Arduino is very easy to use as compared to another models. It has 28 pins in total. Also 3 Ports in total which are named as Port B, Port C and Port D in which Port C is an analogue Port and it has six pins in total. So, in simple words, ATmega328 has 6 analogue pins. And Port B and Port D are digital ports and have 7 pins each. So, in total ATmega328

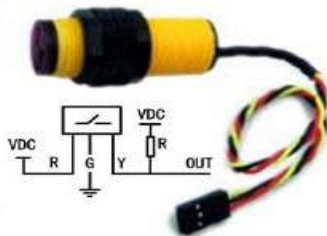
has 14 digital pins. It also supports Serial Communications, we can perform serial communication via Pin # 2 (RX) and Pin # 3 (TX). It also supports SPI Protocol. It needs a crystal oscillator for generating the frequency. You can use crystal oscillator ranging from 4MHz to 40 MHz. Arduino UNO board uses 16MHz crystal oscillator.

Serial communication:

The interfacing circuit is actually serial to USB converter. Now a days serial port is not available in new generation PC's or laptop so we have to use this serial to USB converter.

Proximity sensor:

This is an infrared distance switch. It has an adjustable detection range, 3cm-80cm. it is small, easy to use/assemble, inexpensive, useful for robot, interactive media, industrial assembly line, etc.



Red: +5V

Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between the sensor and the sensed object.

Servo motor:



Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.

### 3. WORKING

1. Initially supply is given to the circuit. Total number of parking slot is continuously displayed on the seven segment. The following fig. shown as the front panel of application

where user can enter the details of data. Like number plate and mobile no.



2. When serial communication is start between controller and .net application then select the port name and baud rate which is set in programming code. then click on the start button so that status bar is shown green and there is shown available individual parking slot. this is shown in the following fig.



3. We are used to detect present car or not in the parking area by using ir sensors as shown in the fig. you can see that is any car is front of ir sensor that means these slot is full and it indicate as red sign and if there is available slot then it indicate the blue sign.



4. Once you can enter the number plate and mobile number then you will get a one OTP on that number which is you enter in the mobile no block. you can see that following fig there is get one entry OTP. This OTP you can enter on the enter OTP block. If OTP is matched then gate will be open and user data is inserted on the server explorer table. otherwise it gives a error message. then you can use the any slot of parking area. once you park your vehicle on the parking area then it block shown as a red sign which means that block is not available for other user.



**5.DEMO PROJECT:**



**CONCLUSION**

In this prototype we are trying to simplify the parking system by displaying the parking space. The user will park their vehicle at convenient space for parking using OTP which is sent on their mobile phone. Hence this system will provide safety and security as well as save the time of the particular user.

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We are used the OTP process for the security purpose. This same process is done when user can leave the parking area. Here gate can't open still you can enter the correct otp..

**4. FLOW DIAGRAM:**

