

Project Reference Number:- 46S_BE_3899

Title of the project:- SMART CAR PARKING SYSTEM WITH AUTONOMOUS CAR

Name of the College & Department:- Vidya Vikas institute of engineering and technology
Mysore and Electrical and Electronics Engineering

Name of the Students & Guide(s):-

1. Name: Prajwal V P
Phone Number: 9844320696
Email id: pavanprajwalvp65@gmail.com
2. Name: Preethi S
Phone Number:9036431646
Email id:preethis1298@gmail.com
3. Name: Uma N
Phone Number:8618522975
Email id:uma98nm@gmail.com
4. Name: Prashanth C B
Phone Number: 73496 67298
Email id:prashanthcb2001@gmail.com

Name of the guides:-

1. Name: Prof.Pushpalatha M S
Email id: mspushpa7983@gmail.com
Contact No.: 9731016261
2. Name: Prof.Spoorthi S N
Email id: spoorthisnvviet0904@gmail.com
Contact No.: 9986221801

Keywords:- Arduino UNO, IR sensors, Motors, Ultrasonic sensor, Node MCU, Bylnkiot app, motor drive, power supply unit.

Introduction

The world's population is growing, and cities are becoming more crowded, resulting in an increase in the Number of automobiles on the road. The management of car parking is one of the primary difficulties in cities. It is inevitable for the people to update with the growing Technology In the past, studies on how to structure parking systems were done. Smart parking systems, on the other hand, Are still in demand and are attracting researchers' interest as a potential upgrade to meet modern needs and Requirements. It is critical to monitor and manage vehicle access in government and private sector parking lots. As a result, the goal of this study is to create and construct a Smart parking system employing mobile application technology. The created system can control allowed Vehicle admission into parking areas while blocking unauthorised vehicles. Currently, smart parking or parking Guidance systems just receive available parking spot information from deployed sensor networks and then Simply distribute it to drivers. Finding the parking slots and also it avoids the unnecessary Travelling through filled parking slots in a parking area. It is very difficult to find a Suitable parking place in parking slot. We have proposed a suitable solution to this problem. We'll utilise an Arduino UNO has already made a huge impact on learning., a servo motor, IR sensors, and an LCD display in This project. IR sensors detect vehicles entering and exiting parking lots and transmit a signal to Arduino; an LCD shows the number of parking spaces available. We can know whether parking spots are available or not Even before entering the parking area with the use of such a solution, and we can save fuel consumption, time, and Pollution, also which in turn reduces carbon footprints in an atmosphere by using this strategy. This project gives information on this framework, the vehicle can drive itself and find the parking spaces to consequently leave the vehicle using ultrasonic sensor. The framework includes parking spot chasing and empty space recognition. As demonstrated by the sort of the parking spot which has been seen by the sensors, the framework will record the proper parking space and do the required stopping activity.

Objectives

- **Smart Car Parking System**

Created automatic car parking system, using an hardware & programmable sensors

- **Autonomous Car**

Reduces more time in searching the parking slot and required manpower to maintain a parking system.

Methodology

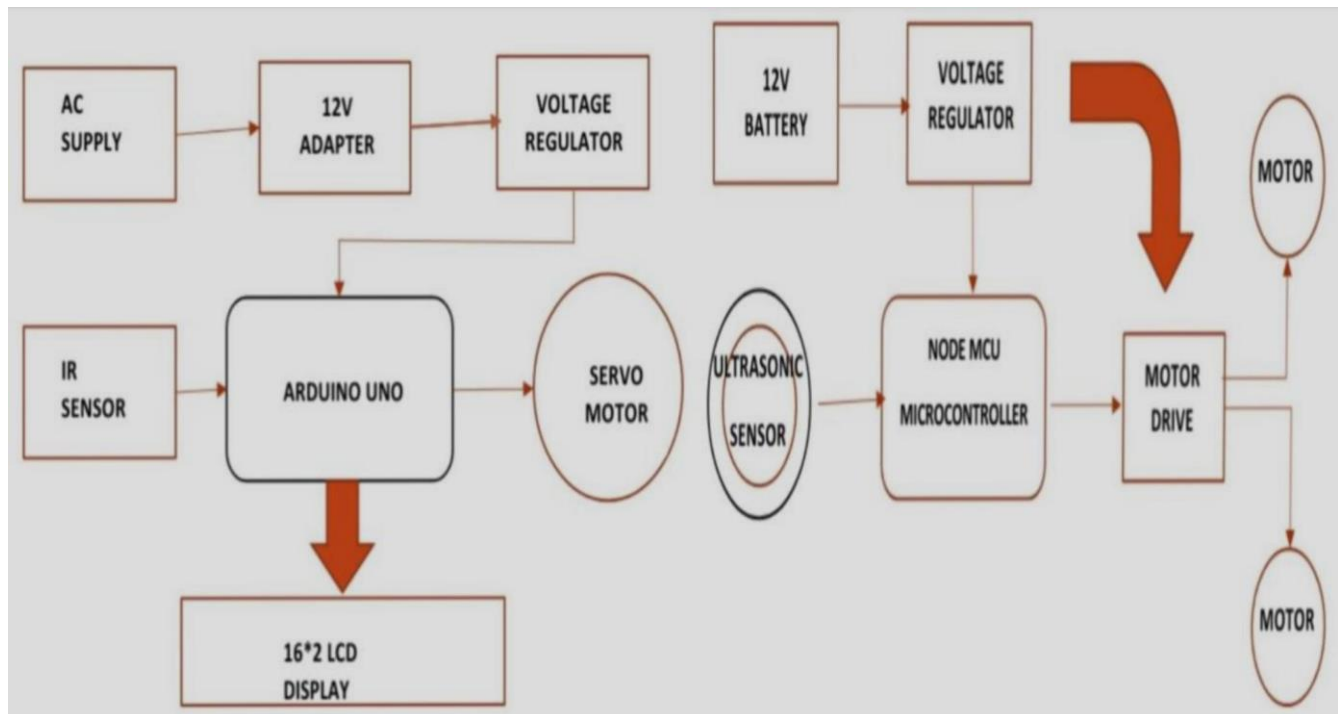


Fig:- block diagram of smart car parking system with Autonomous Car

In this Project it is proposed to design an embedded system which is used for parking vehicle by Using node mcu and mobile communication using Blynk app in this project GA328P Microcontroller is used for interfacing to various hardware peripherals. The supply is drawn from battery is directly fed to voltage regulators, which regulates the Voltage and fed it to the Arduino microcontroller, Motor driver, Ultrasonic and IR sensors To function properly. Arduino MC controls the peripheral which is connected to it according to program Developed. The Project Consist of IR sensor, Servo Motor LCD Display with Arduino UNO micro controller. In other end the car circuit consists of Ultrasonic sensor, motor drive, Brushless Motor, and Node MCU. A Node MCU is a Wi-Fi module which are connected through Mobile App called Blynk App. A blynk app is operated with Car in parking Area, were the parking slot is free, when the user Is left the car in the parking Zone and select the parking button in mobile using Blynk App. The car will automatically search the free space in the parking area and in parking area we are Installed 16*2 LCD display, The display shows the free space of parking slot and sense the car Using sensors and the gate will automatically opened using servo motor and the car will Automatically parked in the free space. After get back to the pickup zone and select the pickup Button using Blynk App the car will automatically get back to pick up zone and pick the user. The smart car parking system works on the simple principle of Detecting obstacle and sending a Visual feedback. The Proximity sensor is mounted on the ceiling of the parking lot Which consists Of an Infra-Red emitter and a receiver. The IR Emitter

emits infra-red rays and these rays generally Bounce off Objects. The IR receiver receives these rays and converts them Into an electrical signal Creating a potential difference. The Resulting potential difference helps complete the circuit. The LEDs are placed along the driveway and switch on based on the Input received by the sensor. Resistors are provided to ensure the safe working of IR sensors. For this project based on size a 12V Battery and adopter is used to power all the components.

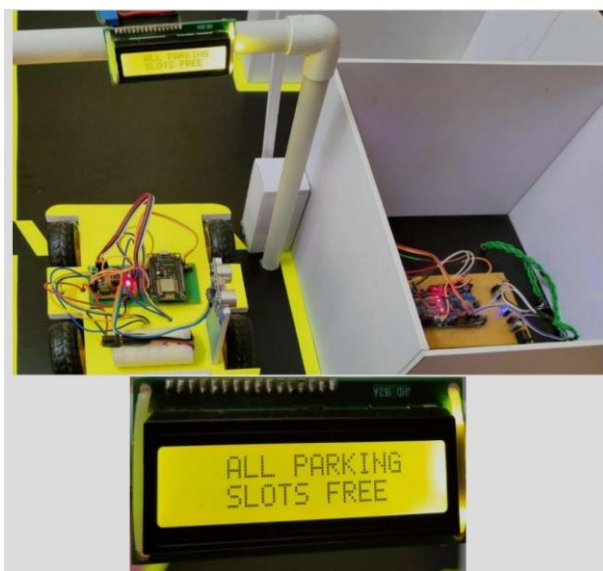
Case 1: When the parking space is empty, the IR emitter Emitting the rays will not Bounce back An object (vehicle) is not Detected. The rays will not strike the IR Receiver and hence there Will be No rise in potential difference. The feedback of This Result makes the LCD display is indicating The Availability of a parking Space.

Case 2: When the parking space is occupied, the IR rays Emitted by the emitter is Bounced back As the vehicle height is Within the threshold distance and the rays Strike the receiver and These Waves are converted into an electrical signal creating A Potential difference. The feedback of this Result is indicates by LCD display the Parking space is filled. There is continuous emission of IR Waves so the feedback Is Instantaneous. As soon as the vehicle exits the parking space, The rays Don't return back and display the availability of parking space.

Results and Conclusions

Indicates Empty Parking Slots

Case 1:- When the parking space is empty, the IR emitter Emitting the rays will not bounce Back, an object (vehicle) is not Detected. The rays will not strike the IR receiver and hence There Will be no rise in potential difference. The feedback of this Result makes the LCD Display to indicate “ ALL PARKING



SLOTS FREE “ and also gate is opened.

Fig :- Availability Of Parking Space Are Free

Indicates All Parking Slots Full

Case 2:- When the parking space is occupied, the IR rays Emitted by the emitter is bounced Back, as the vehicle height is Within the threshold value of distance and the rays strike the Receiver and signals are converted into an electrical signal creating a Potential difference. The feedback of this result makes the LCD display to indicate “ ALL PARKING SLOTS FULL “. There is continuous emission of IR waves so the feedback is Instantaneous. As Soon as the vehicle exits the parking space, The rays don't return back and display to Indicate free parking spots and when all slots are full gate is closed.

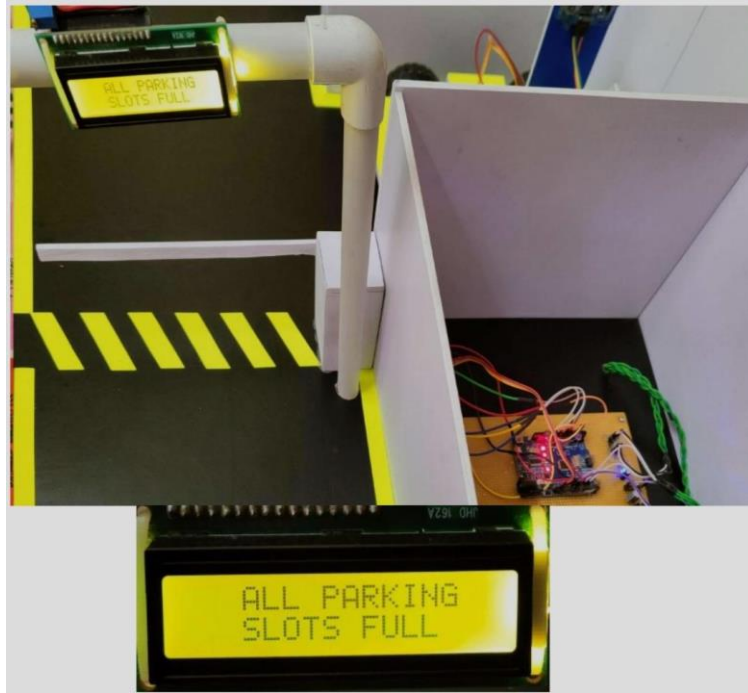


Fig :- Availability Of Parking Space Are Full

Indicates Frist Parking Slot Full

Case 3:- When parking space are free click the park button on bylnk iot app. Autonomous Car start moving and finding out the available parking space and also detect the free spots Is sufficient or not for parking. If slot 1 is free or empty car will be parked on that slot and IR rays Emitted by the emitter is bounced back as the vehicle height is Within the threshold Distance and the feedback of this result is indicated by LCD display “ SLOT 1 FULL” and Click the unpark button car will be exit from parking slot 1.

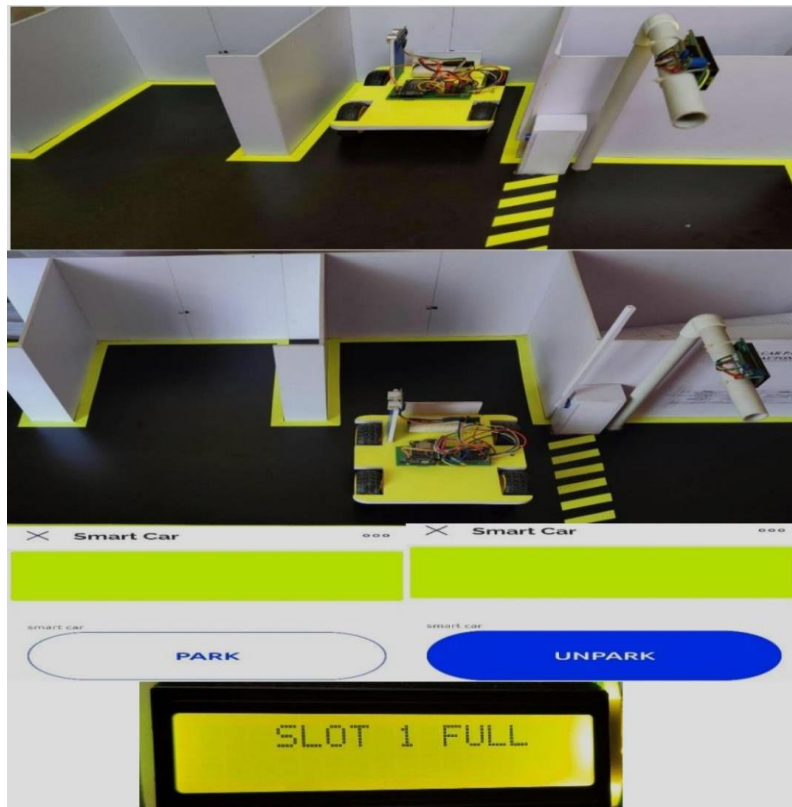


Fig:- Frist Parking Slot Full And Bylnk Iot App Interface

Indicates Second Parking Slot Full

Case 4:- When slot 1 is full it's moving and detect for next available slots. If the slot 2 is Free or empty and also sufficient or not for parking (and if not sufficient for parking it's Moving further available slots and also detecting sufficient space.). The car will be parked On that slot and IR rays Emitted by the emitter is bounced back as the vehicle height is Within the threshold distance and the feedback of this result is indicated by LCD display “ SLOT 2 FULL” and click the unpark button car will be exit from parking slot 2 and this Process of available space detection for parking is continue.

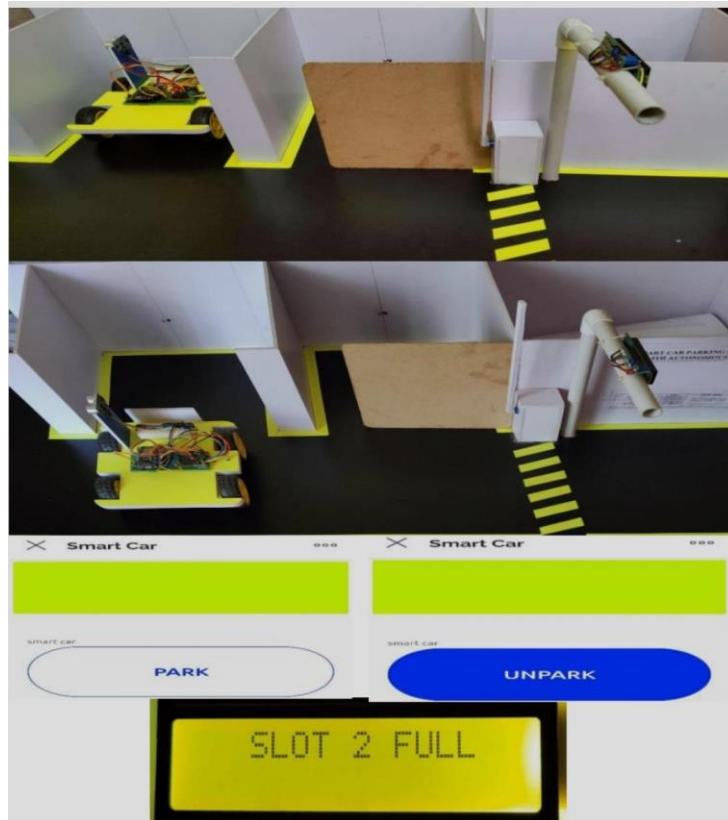


Fig:- Second Parking Slot Full And Bylnk Iot App Interface

Conclusion

This project is helps to find out the parking spots for Public by using the IR sensors are detects the free spots and also indicate by LCD display and all sports are filled the gate is automatically closed. It means no more free space or available for car parking. The autonomous car is drive itself without humans it's controls the only through mobiles app for park and unpark. This autonomous car very helpful for deducting the free and sufficient space and safe time in doing so. As Arduino is the latest technology, using it gives uniqueness to our project.

Scope for future work

In future works, implement the iot for book the parking spots by use of GSM. The car driver or peoples are easily book the parking spots at home or while traveling to the shopping malls, big store...etc and use of big display for indicating the number of free and filled spots it's very helpful for car drivers also shows or notify the car parking spots. When implements the lidar sensor to automotive car it will be enhance detecting the free and sufficient space for parking. Lidar means light detecting and ranging sensor it covers 360 degree and measures the distance, objects and other opticals perfectly and it is more helpful for perfect parking without any accidents and artificial intelligence also more helpful for autonomous car to take the war decision and drive the car automatically without a human interference and this features are future generation of Autonomous car and it is eco user friendly.