Smart Car Parking System

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Abstract:

This project proposes a smart car parking system that utilizes Arduino UNO, a servo motor, a 16x2 i2c LCD display, two IR sensors (one at the entry and the other at the exit), a PAM 8403 Amp, and a speaker to inform the user about the availability of parking slots. The system works by detecting the presence of a car using the IR sensors and updating the display to show the number of available slots. The servo motor controls the barrier at the entry and exit, while the PAM 8403 Amp and speaker provide voice notifications to guide the driver through the parking process. This system simplifies the parking process by providing real-time information and voice guidance, enhancing the overall parking experience.

Keyword: IR Sensors, updating the display, voice guidance.

Introduction:

A smart car parking system is an intelligent system that enables users to easily locate available parking slots within a parking lot. In this system, an Arduino UNO microcontroller is used along with a servo motor, a 16x2 i2c LCD display, two IR sensors, a PAM 8403 Amp, and a speaker.

The system operates by using IR sensors at the entry and exit points of the parking lot to detect the presence of vehicles. When a vehicle enters the parking lot, the IR sensor at the entry point sends a signal to the Arduino UNO microcontroller. The microcontroller then activates the servo motor to move a sign indicating the number of available parking slots.

Additionally, the microcontroller also displays the available parking slots on the 16x2 i2c LCD display and announces the number of available parking slots through the speaker connected to the PAM 8403 Amp.

When a vehicle exits the parking lot, the IR sensor at the exit point sends a signal to the Arduino UNO microcontroller, which then updates the available parking slots on the LCD display and announces the updated number of available slots through the speaker.

Overall, this smart car parking system provides an efficient and convenient way for users to find available parking slots in a parking lot, while also providing real-time updates on the number of available parking slots through voice announcements.

Literature Survey:

IR Sensor Detection:

A smart car parking is basically based on the main idea of sensing the car and detects the availability of the slots. For this IR Sensors plays the major role. This paper [1][3][4][5] proposes an Intelligent Parking

System that uses various sensors which will be based on an Atmega328 Application as interface to help book or view available spaces. The project involves a system including an infrared transmitter and receiver in every lane and here we user indicator lights outside the car parking gate. So the person entering the parking area can view the indicator lights display and can decide which lane to enter so as to park the car.

Voice message:

The smart car parking only consists of only displaying the availability of slots to the drivers. So, the voice message idea is done by storing the data in a storage device. This paper [2] proposes a suitable cloud computing platform such as Amazon Web Services (AWS) or Microsoft Azure. The system architecture consists of end user,admin & parking controller which is stored in a cloudstorage. The parking slotscan be booked by a user by designing a phone application in which the user can track & book the empty slots available.

Methodology:

Existing System:

In previous projects of this "Smart Car Parking System" it only provides the displaying of availability of empty slots for car parking. An LCD display is placed at the entrance, which is used to show the availability of parking slots in the parking area. When a vehicle arrives at the gate of the parking area, the display continuously shows the number of empty slots. If there have any empty slots then the system opens the entry gate by the servo motor. After entering the car into the parking area, when it will occupy a slot, then the display shows this slot is full. If there is no empty parking slot then the system displays all slots are full and does not open the gate.

Proposed System:

In our project of this "Smart Car Parking System" we added Speaker with 8403 Amp to inform through a audio message about the availability of parking slots in the parking area. The speaker is connected with Arduino UNO via 8403 Amp. The availability of empty slots is informed via speaker which is connected with our Arduino UNO. So, the driver can be easily acknowledged about the slots availability when he/she fails to see the LCD Display.

Block Diagram:
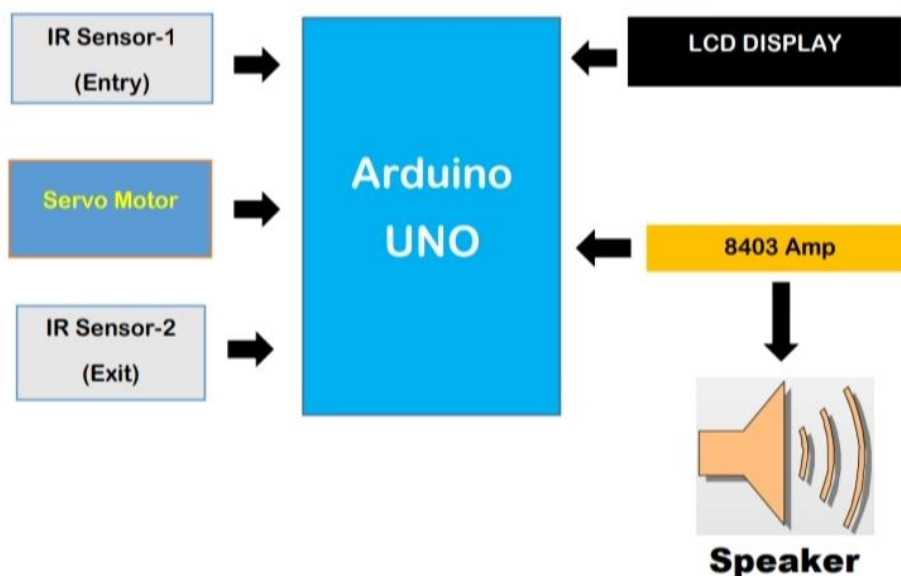
Results and discussion:

The existing projects proposed only displaying the empty slots for car parking via LCD Display. So, we are adding speaker to inform through audio about the availability of empty slots available for car parking to the drivers. Hence, the driver can be easily acknowledged about the empty slots availability when he/she fails to see the LCD Display.

Conclusion:

The smart car parking system you have described seems like a feasible and useful application of technology. By utilizing an Arduino UNO, a servo motor, a 16x2 i2c LCD display, two IR sensors, a PAM 8403 Amp, and a speaker, you have created a system that can detect the availability of parking slots and provide audio feedback to the user.

The use of IR sensors at the entry and exit points of the parking lot allows the system to accurately detect the presence of a vehicle and keep track of the number of available slots. The servo motor can be used to indicate the location of available slots on the LCD display, while the audio feedback provided through the speaker can inform the user about the availability of parking slots.

Overall, the smart car parking system you have designed has the potential to make the parking experience more convenient for users while also helping to manage traffic flow within the parking lot.
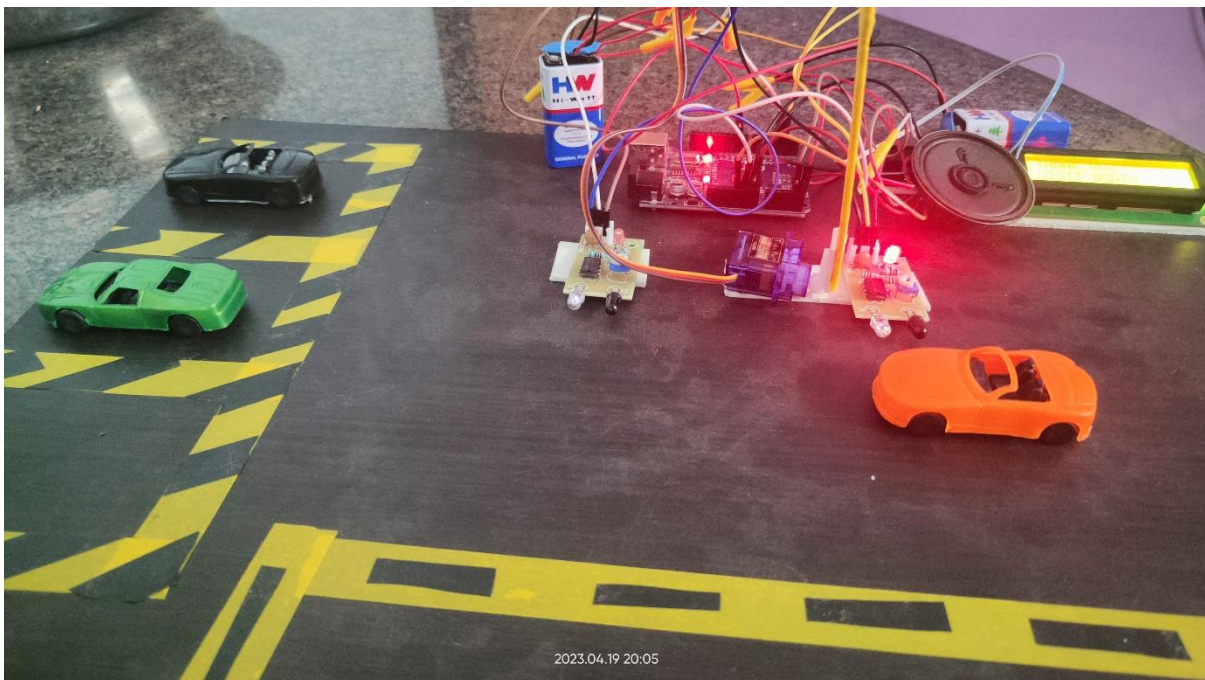
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