Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

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CSE 3118 Microprocessors and Microcontrollers Lab

Project Proposal

Project Name: *Automatic Car Parking System*

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Objective

The main objective of this project is a smart car parking solution is to identify a vehicle's presence or absence in a particular parking space with a high degree of accuracy, and to pass on this data into a system for visualization and analysis. A Smart Parking is a parking solution that can include in-ground Smart Parking sensors, cameras or counting sensors. These devices are usually embedded into parking spots or positioned next to them to detect whether parking bays are free or occupied. It gives a visual output indicating an available parking space rather than driving aimlessly. The driver looks up to the row of LED lights and their color to deduct a result of determining the parking space availability. These lights are controlled automatically with sensors and the feedback is provided through the color of the LED when a vehicle is detected. This system not only makes the accessibility easy but also manages the congestion of vehicles avoiding long search and wait times.

Social Values

Smart parking systems are starting to offer solutions for urban mobility. Day by day the numbers of vehicles are increasing. This car parking system makes the car protected and secured. By using this system, we can park many cars in a small space. There are some Potential Benefits of Smart car Parking
system.

- Consumption of Less Fuel. ...
- Cost and Time Efficient Solution. ...
- Minimize the Personal Carbon Footprint. ...

- Reduce Parking Stress. ...
- Reduce Search Traffic on Streets.

Here users find the optimized parking system. Users find the best spot available, saving time, resources and effort. Also we can reduce the traffic .Traffic flow increases as fewer cars are required to drive around in search of an open parking space. It also reduce pollution because searching for parking burns around one million barrels of oil. An optimal parking solution will significantly decrease driving time.it also saves the time that none need not guard in 24 hours.so here we can save the manual cost. It can help to prevent parking violations and suspicious activity. It can also reduce the accident. By this project, we can decrease the management cost. This is how we can make the social values by using this system.

Required Components

These following parts and tools are required for building this project

- Arduino UNO 1P
- Alphanumeric LCD, 20x4 1P
- DF Robot 12C 16x2 Arduino LCD Display Module 1P
- Digilent IR Range Sensor 1P
- SG90 Micro-servo motor 1P
- Connector Adapter, DC Power -2.1mm 1P
- Digilent 5V 2.5A Switching Power Supply 1P

Working Procedure

Arduino UNO:

This system is capable of finding the empty slots that are available for parking automatically. If the slot is empty in the automated car parking the new vehicles

Alphanumeric LCD, 20x4:

Ray star provides various LED backlight combinations for RC2004B 20x4 LCD module, such as yellow-green and white. You can choose module with LED backlight or without it. LED backlight can be driven by PIN1, PIN2, PIN15, PIN16 or A and K.

Digilent IR Range Sensor:

For detecting the movement of vehicles we are using the IR sensors.

DF Robot 12C 16x2 Arduino LCD Display Module :

To display the parking status we are using a 16x2 LCD.

SG90 Micro-servo motor :

Servo can rotate approximately 180 degrees (90 in each direction).Servo motor works on PWM (Pulse width modulation) principle, means its angle of rotation is controlled by the duration of applied pulse to its Control PIN. Basically servo motor is made up of DC motor which is controlled by a variable resistor (potentiometer) and some gears. High speed force of DC motor is converted into torque by Gears. We know that WORK= FORCE X DISTANCE, in DC motor Force is less and distance (speed) is high and in Servo, force is High and distance is less. The potentiometer is connected to the

output shaft of the Servo, to calculate the angle and stop the DC motor on the required angle.

Connector Adapter:

Connectors and adapters enable you to stream data into or out of an event stream processing engine.

Digilent 5V 2.5A Switching Power Supply :

A power supply is an electrical device that supplies electric power to an electrical load. The main purpose of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load.

Estimated budget

Equipment	Quantity	Budget (Tk)
Arduino Uno	1	1450
Alphanumeric LCD Display 20*4	1	650
Arduino LCD Display 16*2	2	500
IR Range Sensor 8	8	1000
Micro-Servo Motor	1	200
Connector Adapter DC Power 2.1 mm	1	300
Digital 5v 2A Switching Power Supply	1	250
Breadboard	1	250
Necessary wires & Others	As required	550
Hard Board	As required	200
Total		**5150**

Conclusion

In this Arduino based project we will implement a Smart Car Parking System. It can be concluded that with correct connection of some simple electrical components, it is possible to create an automatic smart car parking system, thus decreasing aimless driving, fuel and time, as well as making the process of parking considerably simpler. This system will ensure the safety of the vehicles. Our users can make their vehicles safe & secure by using this system.