Smart Car Parking System

Project Report

Submitted in the partial fulfillment of the requirements for the

Course Title: Project Based Learning I

Course code: 21IE2046N

submitted by

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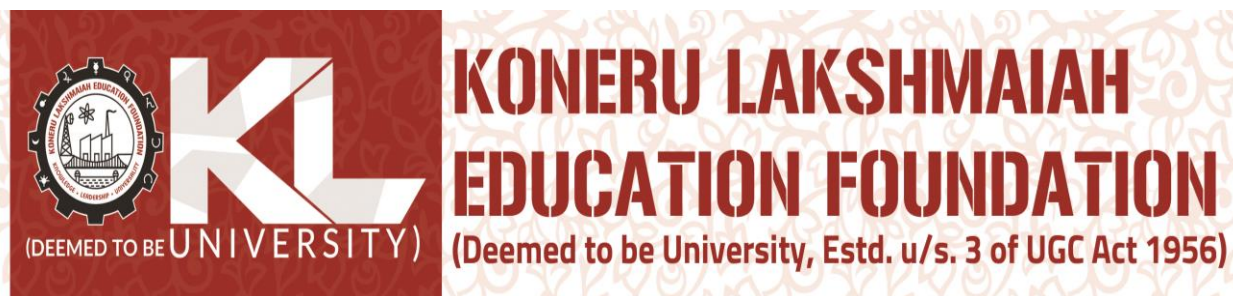
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Declaration

The Project Report entitled "Smart Car Parking System" is a record of bonafide work of by T. Vasavi (2100040271), SK. Ayesha (2100040277), T. Viswavasupradha (2100040278) submitted in partial fulfillment for the subject titled Project Based Learning-I(21IE2046N) in Dept of ECE, KL University. The results embodied in this report have not been copied from any other departments/University/ Institute.

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Certification

This is to certify that the Project Report entitled " Smart Car Parking System" is being submitted by T. Vasavi (2100040271), SK. Ayesha (2100040277), T. Viswavasupradha (2100040278) in partial fulfillment for the subject titled Project Based Learning-I(21IE2046N) in Dept of ECE, KL University is a record of bonafide work carried out under our guidance and supervision. The results embodied in this report have not been copied from any other departments/ University/ Institute.

Signature of Examiner   **Signature of Supervisor**

Acknowledgement

It is great pleasure for me to express my gratitude to our honorable President Sri.KoneruSatyanarayana, for giving the opportunity and platform with facilities in accomplishing the project based laboratory report.

I express the sincere gratitude to our principal Dr. T Rama Krishna for his administration towards our academic growth.

I record it as my privilege to deeply thank our pioneer DR. M Suman, HOD-ECE for providing us the efficient faculty and facilities to make our ideas into reality.

I express my sincere thanks to our project supervisor **Dr. C. Santhosh /Dr.I.Govardhani** for his/her novel association of ideas, encouragement, appreciation and intellectual zeal which motivated us to venture this project successfully.

Finally, it is pleased to acknowledge the indebtedness to all those who devoted themselves
directly or indirectly to make this project report success.

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ABSTRACT

Smart car parking project aims at providing a confusion free and easy parking. This project helps the drivers of the cars to park their vehicles with minimum wastage of time with accurate information of the availability of the space to park It includes an Arduino Uno as the microcontroller unit to which the servo motors, LCD display ultrasonic sensors (HC-05) are interfaced. The LCD displays the availability of the space, the ultrasonic sensors keep the check of the number of cars entering and exiting the parking space. The ultrasonic sensors detect the availability of the parking space.

The use of vehicles has increased as the population of cities has grown. It creates parking issues, resulting in traffic congestion, driver irritability, and pollution. When we go to different public venues such as retail malls, multiplex cinema halls, and restaurants, we create more parking issues. According to a recent study, it takes roughly 8 minutes for a motorist to park his vehicle since he is distracted. 30–40% of traffic congestion is caused by this searching. We'll look at how to use Arduino to solve the problem of automatic self-parking. The major goal of this project is to come up with a practical solution to the problem of auto parking, which affects the entire world on a regular basis. We built a self-parking system with open-source hardware, customizable sensors, and the usage of artificial intelligence.

CHAPTER 1: INTRODUCTION

1. Introduction

In these modern days finding car parking is a big issue in congested cities. There are too many vehicles on the road but not enough parking spaces. One of the biggest problems is when we enter a parking area then we realize that there are no empty parking slots to park our cars. Important time.

Another biggest problem is after entering in a big parking area we confused to find the empty parking slot to park our car. Sometimes maybe we all have been facing these two problems that wasted our important time.

That's why we need efficient parking management systems in all parking areas that will provide confusion-free and easy parking.

we will design a "Smart Parking System Project" to overcome this problem. This project helps the car's driver to park their car with minimum wastage of time with accurate information of the availability of the space to park.

Smart car parking is an automated, flexible, user friendly and highly efficient technology as the booking of parking slot for the driver's vehicle is made possible using an Android app. Also, the operator can easily keep the track of vehicles entering and exiting the parking space and parking fees collected.

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.

CHAPTER 2: Literature Survey

[1] Faiz Shaikh1, Nikhil Kumar B.S.2, Omkar Kulkarni3, Pratik Jadhav4, Sai deep Bandarkar5- 2015 has proposed A Survey on "Smart Parking" System This paper focuses on different smart parking techniques developed to overcome said problem using various wireless sensor network and providing real-time dataanalysis from the sensors, some papers include system based on resource allocation and reservation of parking lot which have various problems in efficiently achieving the goals.

[2] Prof. Yashomati R. Dhumal1, Harshala A. Waghmare2, Aishwarya S. Tole2, Swati R. Shilimkar2-2016 has proposed Android Based Smart Car Parking System-The purpose of this system is to computerize the parking space reservation.

[3] Aishwarya D Kuchalli2, Debarupa Rakshit-2016 has proposed A survey paper on smart parking system based on internet of things a Smart Parking system---- It provides an optimal solution for parking problem in metropolitan cities. Due to rapid increase in vehicle density especially during the peak hours of the day, it is a difficult task for the drivers to find a parking space to park their vehicles. The aim of the paper is to resolve the above-mentioned issue.

CHAPTER 3: Requirements

1) Arduino:

   Arduino Uno is a microcontroller board based on the ATmega328P. The board features 14 digital I/O pins (six of which are capable of PWM output), 6 analogue I/O pins, and is programmable through a type B USB cable using the Arduino IDE (Integrated Development Environment).
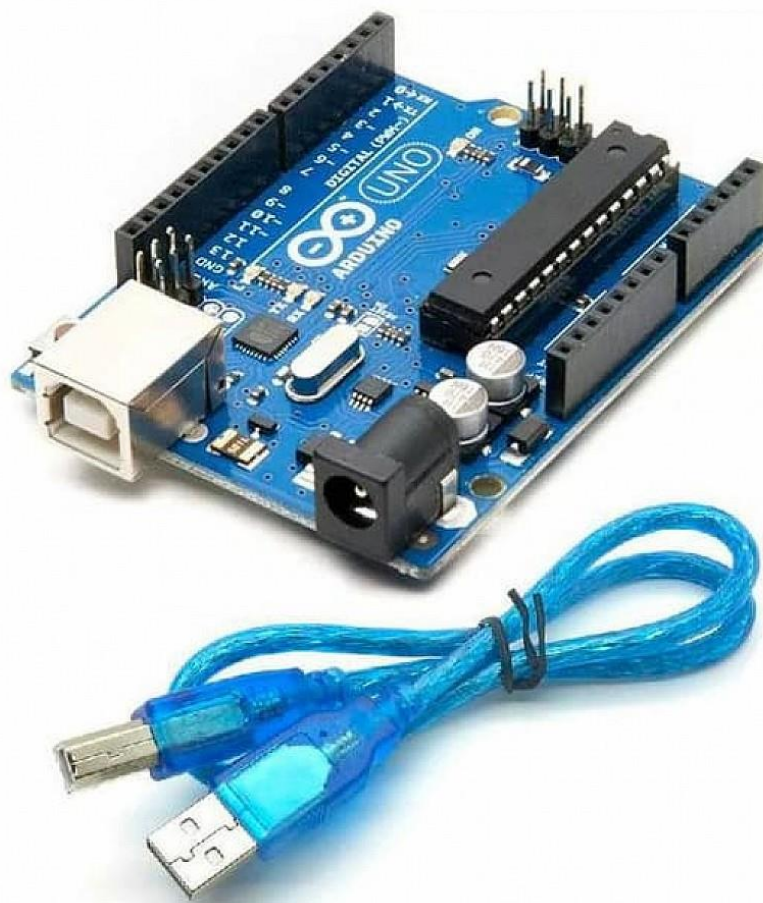
2)   IR Sensors:

An infrared sensor is basically an electronic device which is used to detect the presence of objects. Infrared light emitted by this device. If this device does not detect any IR light reflected back that means, there is no object present. If the light is detected by the sensor there is an object present.
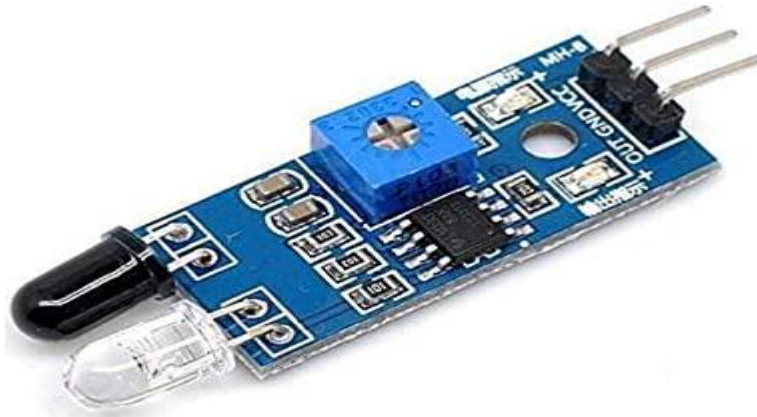
3)   Servo motor:

A servomotor is a linear or rotatory actuator that permits exact control of angular or linear position, velocity, and acceleration.

4) LCD Display:

The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols.16×2 LCD is named so because; it has 16 Columns and 2 Rows.

5) I2 C module

I2C Module has a inbuilt PCF8574 I2C chip that converts I2C serial data to parallel data for the LCD display. The module has a contrast adjustment pot on the underside of the display. This may require adjusting for the screen to display text correctly.

Chapter 4: Methodology

- Here we have connected sensors to the Arduino, when car enters in parking slot IR sensor senses the incoming car and then servo motor lifts up the gate of parking slot to let that car in. Once the entered car can occupy any of the available parking slot.
- When the occupies a specific slot then its updated in the Arduino and it displays the updated information in LCD display and next car entering the parking slot can see beforehand which slot is available to park.
- At the time of car exits the parking slot IR sensor senses the car and lifts up the gate and once the car is out of the parking slot it again updates the information of the available slots.

Chapter 5: Theoretical Analysis

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 are allowed to enter the parking else the entrance is blocked by using the servo barrier in case no empty slot is found by the system. The visitors can see the status for the availability of the free space outside the parking on a 16×2 LCD

This smart parking system project consists of Arduino, six IR sensors, one servo motor, and one LCD display. Where the Arduino is the main microcontroller that controls the whole system. Two IR sensors are used at the entry and exit gates to detect vehicle entry and exit in the parking area. And other four IR sensors are used to detect the parking slot availability. The servo motor is placed at the entry and exit gate that is used to open and close the gates. Also, an LCD display is placed at the entrance, which is used to show the availability of parking slots in the parking area.

Chapter 6: Simulation and Results

Servo Motor

IR Sensor 2

IR Sensor 1

I2C Module

16 * 2 LCD

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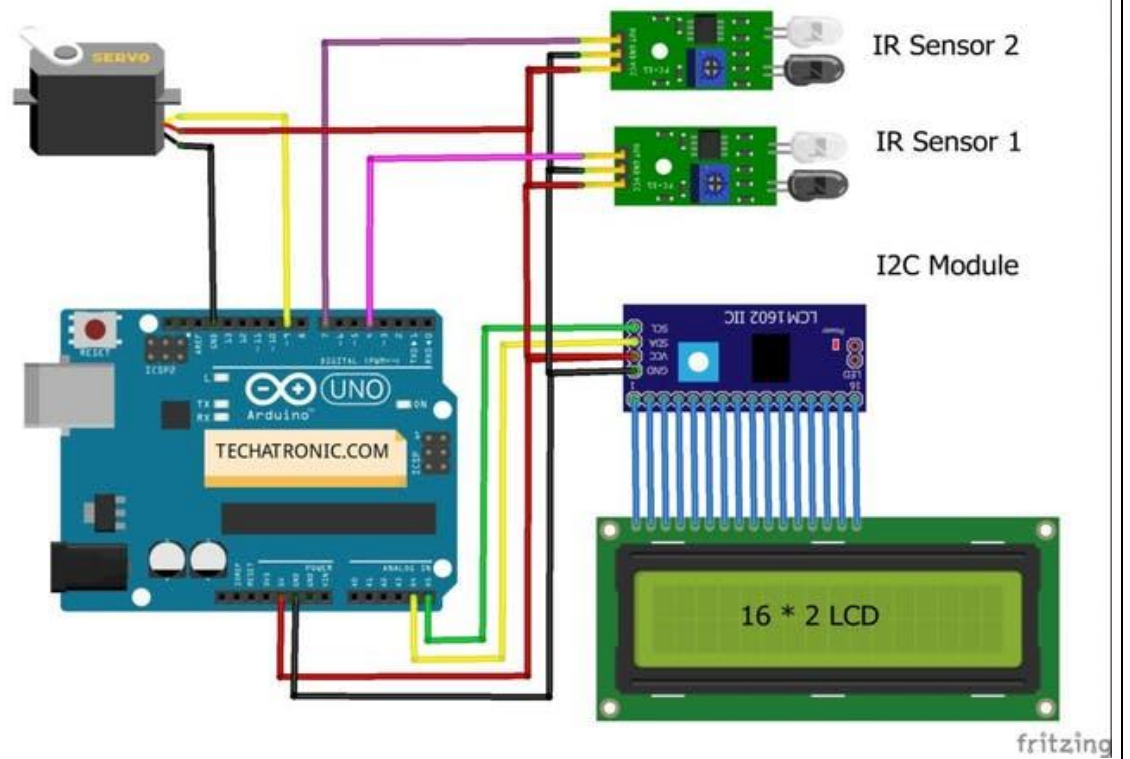
Chapter 7: Hardware implementation
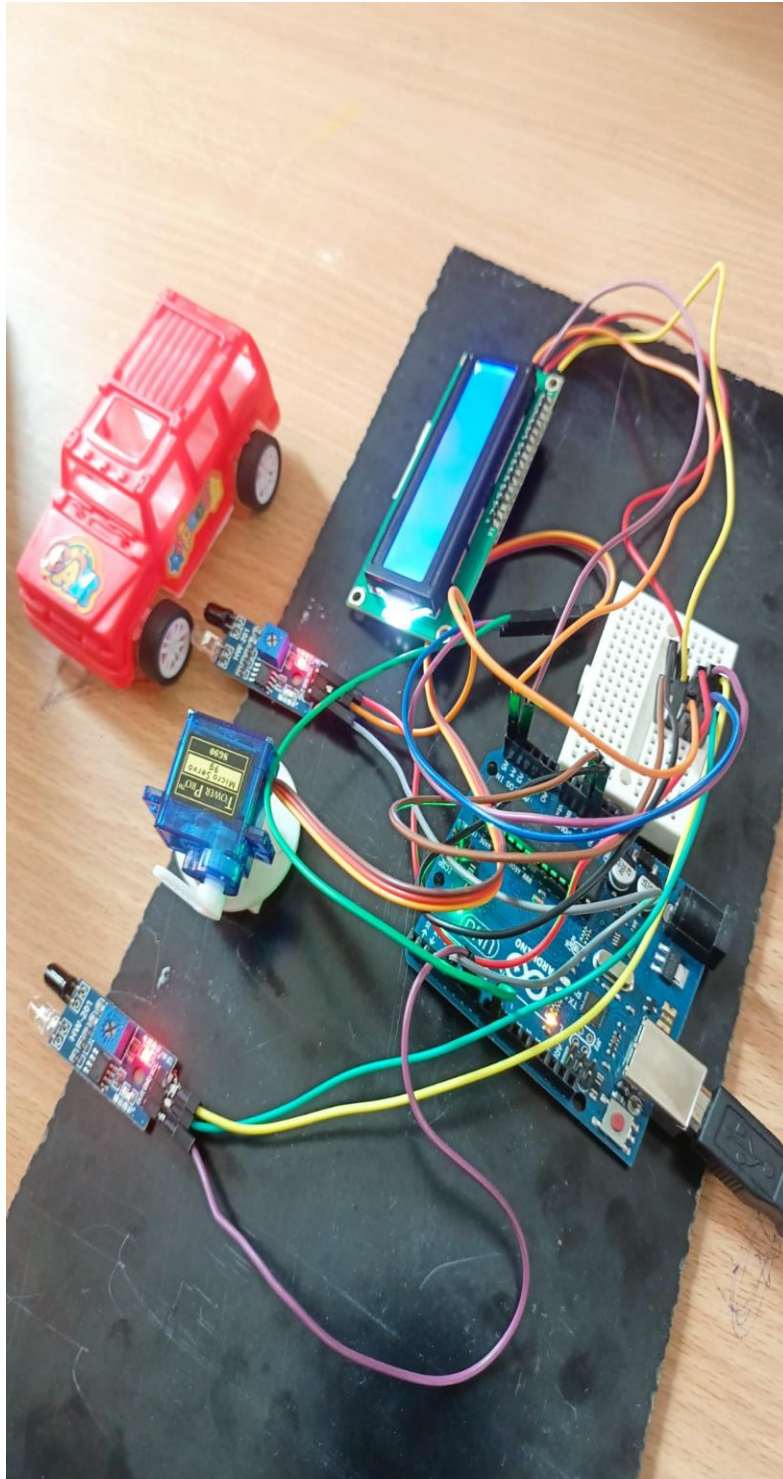
Chapter 8: Conclusion and Future scope

Today vehicles are an important part of everyone. However, traffic is so common that everyone uses vehicles. Nowadays, finding a parking space is a tedious process to park the vehicle while the user is outside. And providing parking space for the vehicle is also an essential source. This document provides an overview of the smart, intelligent parking agenda for the smart city. Therefore, it is one of the efficient sources, according to the current population survey. This model can reduce congestion on the road, time of users, human power, pollution, security for vehicles. The project is completed successfully. Once the user is entered in parking slot, if a slot is available then gate will be opened, and he will park his vehicle in the available slot. If slot is not available, then the gate will not be opened, and he is not allowed to park. If gate will not open, then the parking is full, and message will display on the screen "Sorry NO Parking". The project is working fine.

Furthermore, the proposed parking system was evaluated utilizing a user acceptance test to determine public acceptance of the proposed parking system. Many respondents thought the proposed parking system with IR sensor was a wonderful concept and that developing a parking system that can help cars find a vacant parking spot quickly was a terrific idea. As a result, it provides convenience to users by allowing them to save time, energy, and fuel. This work might be expanded by creating a mobile app that allows users to navigate, identify, and reserve a parking spot online.

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