

VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY



AUTOMATIC CAR PARKING SYSTEM

LBS PROJECT REPORT

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INTRODUCTION

Automobiles are synonyms for mobility and freedom. An amazing increase in the growth of population in this world leads to the rapid increase in the number of vehicle being used. With the growing number of vehicles and the consequent shortage of parking space, there is haphazard and totally unregulated parking of vehicles all over. In densely populated areas they are real challenge for city planners, architects and developers. The need to offer sufficient parking spaces is a task for specialists. This situation calls for the need for an automated parking system that not only regulates parking in a given area but also keeps the manual control to a minimum. Automatic car parking systems is the sole solution to park as many cars as possible in as little space as possible.

Automatic car parking systems are based on the most modern technology of storage systems. Our demonstration facility presents a miniature model of an automated car parking system that regulates the number of cars that can be parked in a given space at any given time based on the parking space availability. Automated parking is a method of parking and exiting cars using sequence detecting and sensing devices. The entry and exit of vehicles are facilitated using a totally automated gate. Status signals indicate whether a car is currently in the process of entering or leaving the parking space. After the initial installation, the system requires no manual control. It requires no attendants, is more cost-effective than conventional garages, and allows more cars to be parked in less space. The automation technology is used to typically double to triple the capacity of conventional parking garages.

MOTIVATION

The main reason behind the selection of the project topic is the need for proper management of the parking of vehicles in public places. If we take a look at the present case scenario ,there is a crucial need to save parking space. With more and more companies and shopping markets coming up the amount of space used for parking is increasing by the day. The main motivation behind this project is to optimize the ground space used for parking by placing parking lots on top of each other. All vehicles enter into the parking and waste time for searching for parking slot. Sometimes it creates blockage. Conditions become worse when there are multiple parking lanes and each lane have multiple parking slots. Use of automated system for car parking monitoring will reduce the human efforts.

PROBLEM DESCRIPTION

Now days in many multiplex systems there is a severe problem for car parking systems. There are many lanes for car parking, so to park a car one has to look for the all lanes. Moreover there is a lot of men labor involved for this process for which there is lot of investment. So the need is to develop a system which indicates directly which parking slot is vacant in any lane. The project involves a system including infrared transmitter and receiver in every lane and a LED display outside the car parking gate. So the person entering parking area can view the LED display and can decide which lane to enter so as to park the car. Display unit is installed on entrance of parking lot which will show LEDs for all Parking slot and for all parking lanes. Empty slot is indicated by the respective glowing LED.

ISSUES AND CHALLENGES

The above project on automated car parking system depicts real-life issues on car parking with a basic overview of present day-to-day life vehicle parking managements in metropolitan cities in and around malls and crowded places. Depiction of the real-life concept of multilevel car-parking into a miniature model using electronic and electrical components requires thorough understanding of the same.

The first challenge arises is the implementation of logic design required for basic detection of slot availability for parking. Infrared sensors can be a good means by which the issue can be resolved. IR sensors are economic and feasible for the purpose.

The next issue is that of interfacing of the IR sensors to indicator LEDs, both of which can be used. A microcontroller can be of use and can be employed to enhance the performance of the overall circuitry. Major challenge is the implementation of the microcontroller part in order to get the desired result. Study of the same is a pre-requisite and will help with the issue.

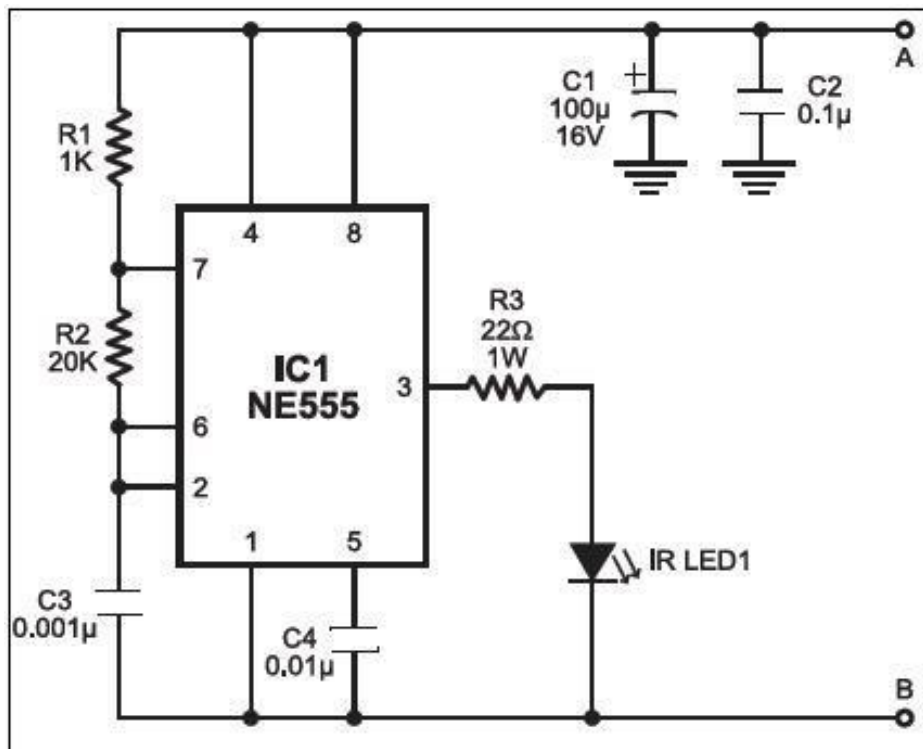
Furthermore, as the number of sensors per slot increase, the overall cost for the project also rises. Thus ,the number of sensors per slot had to be optimized. This was done by efficient placement of the sensors.

For the enhancement of the process efficiently, an Arduino-based circuitry was implemented .

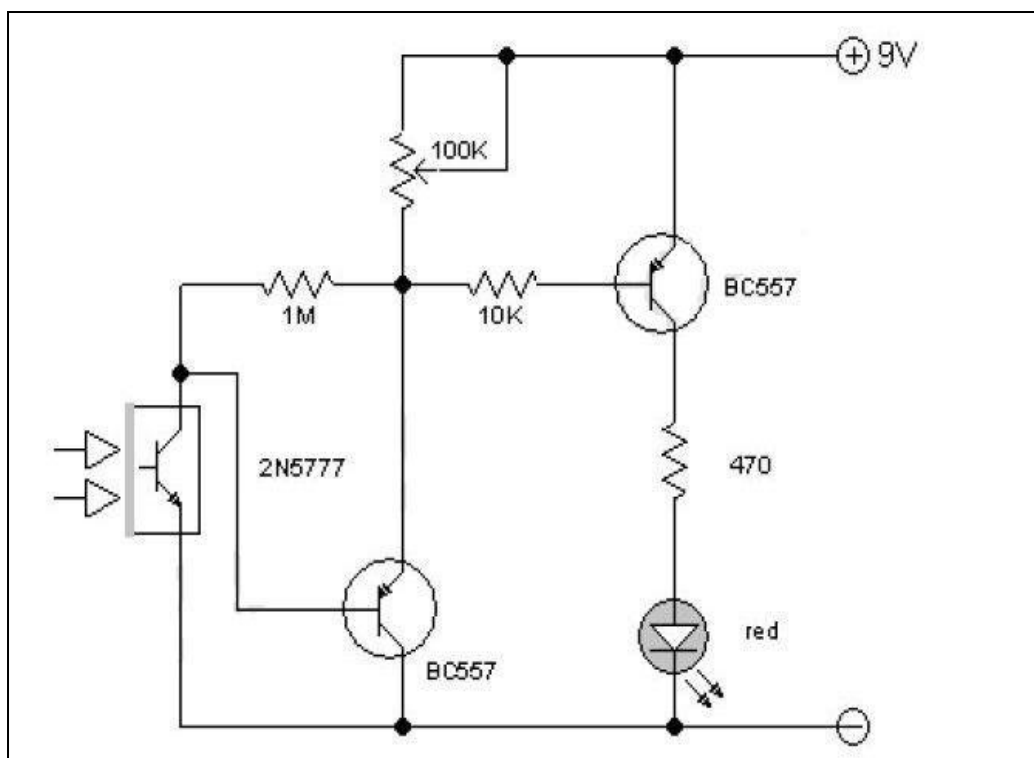


INFRARED TRANSMITTER – RECEIVER SENSORS

TRANSMITTER

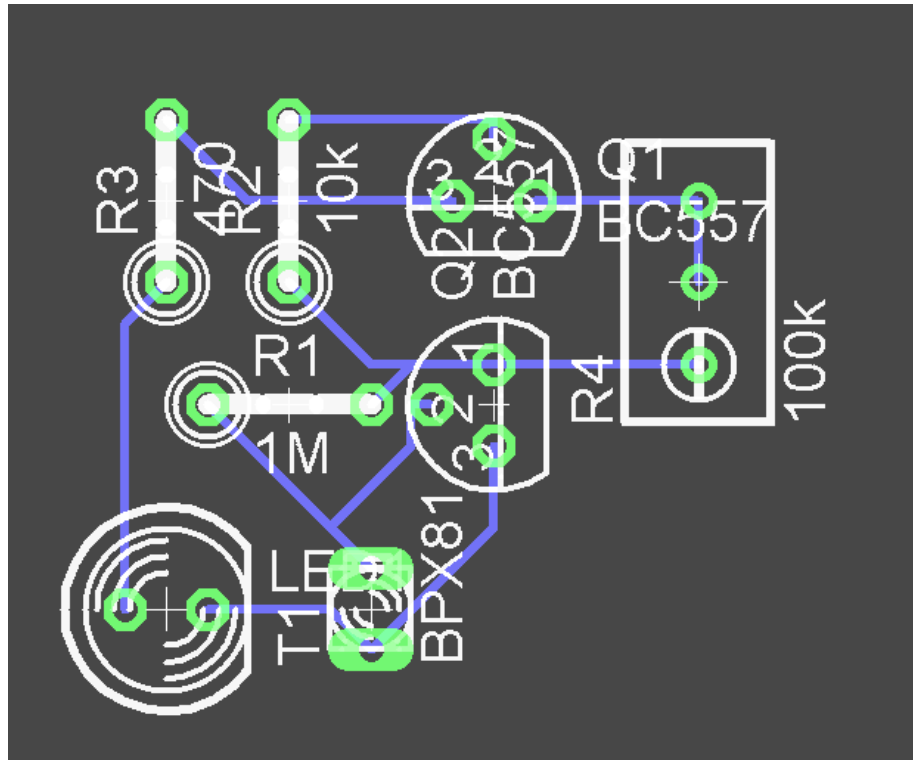


RECEIVER

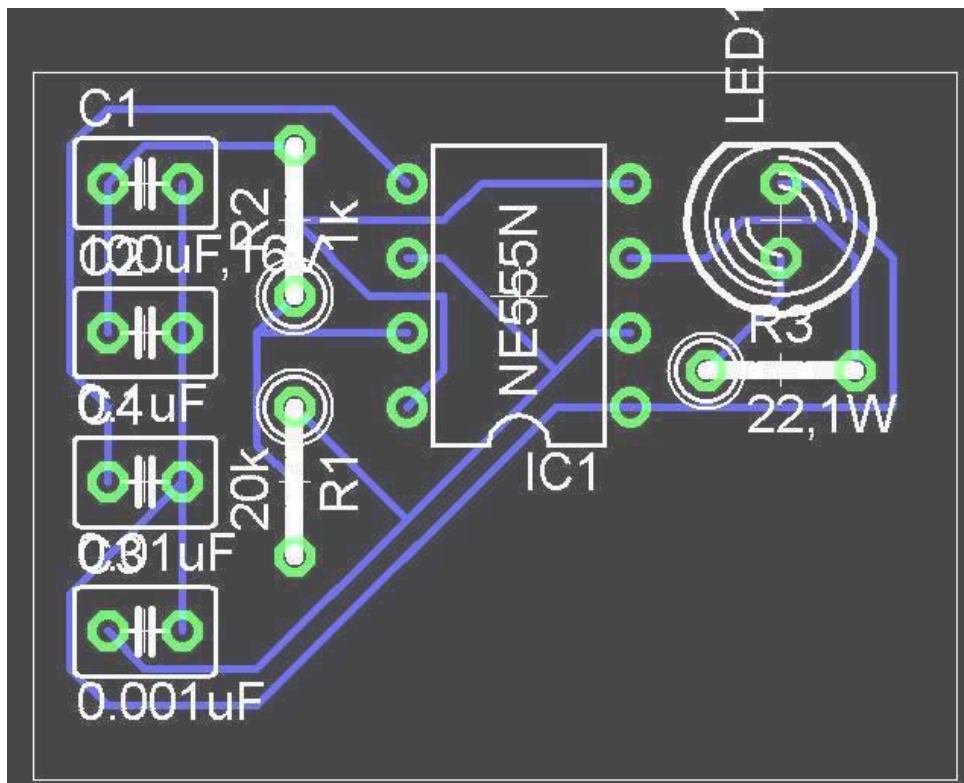


EAGLE SCHEMATICS (NEGATIVE)

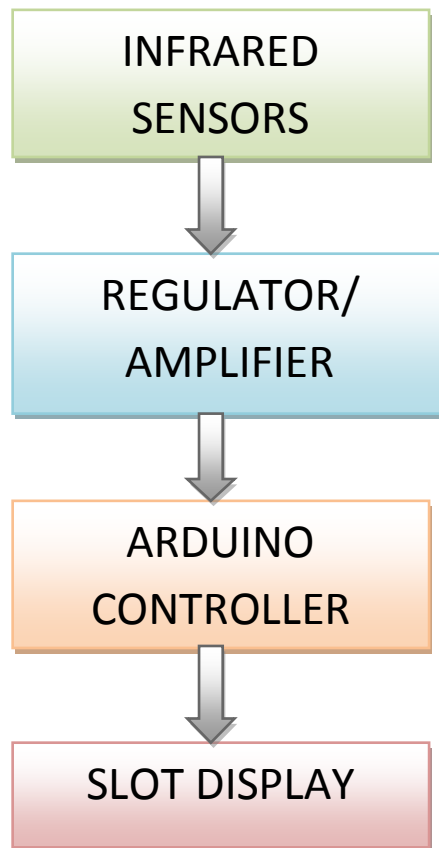
TRANSMITTER



RECEIVER



BASIC FLOW DIAGRAM



INFRARED TRANSMITTER – RECEIVER SENSOR

The obstacle (vehicle) is sensed by the Transmitter – Receiver circuit. A signal is given whenever an obstacle is introduced in between the IR pair. It sends a signal of micro volts to the amplifier circuit.

AMPLIFIER/REGULATOR CIRCUIT

The amplifier circuit amplifies the signal received by the IR pair. The Arduino microcontroller needs 4-5 volts to respond to a signal. This is achieved by the amplifier circuit. It is a simple connection of transistor in Common emitter connection. The circuit amplifies the received signal which is of order μV to 4-5 volts.

ARDUINO CONTROLLER CIRCUIT:

The microcontroller is embedded with a C program. It is designed in such a way that whenever it receives the signal from amplifier circuit it displays the filled and vacant slots in the LED panels.

SLOT DISPLAY UNIT:

The display unit used in the project is LED panel. It displays the filled and vacant slots in the arena through the microcontroller. It is controlled by the microcontroller at the Arduino kit.

SUMMARY

Automatic parking slot indicator is a multilevel car parking setup which can be used to use the parking space available to us prudently. In this arrangement, the circuit indicates the empty parking slots where the cars can be parked. The project will enable the parking of vehicles by displaying the available slots, floor by floor.

Thus when a car is ready to park, it just has to follow the directions given by the setup and park in the slot allotted to it, instead of searching for a parking space. Thus, in a place where 10 vehicles can be parked, 20 or 30 more can be parked due to easy and convenient options.

With the help of Arduino circuitry and IR sensors, the exact tracking of the presence of a vehicle can be monitored and accordingly the response can be generated through the logic thus implemented.

FUTURE SCOPE

With the successful implementation of the above project, the same technology can be efficiently transformed into a real life parking system. Additions such as the GSM modules and other wireless frameworks can be made to the above prototype in order to achieve greater results

REFERENCES

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