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Automatic Gate Control and Parking System Using AVR Controller

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Abstract: This paper is used to develop overcome the problem in parking system. The main challenging problems are wastage of time in finding parking slot in parking areas. This automation used in public and private areas like mall, theatre and college campus, office. The User knows availability of parking slot by using RFID and IR sensor. Using RFID Technology car enters in a parking area and also debut amount for public places for this purpose we use RFID module and RFID tag. RFID tag we identify user's information is legal or not.IR sensor detect the slot empty or full by sensing object. In this system we are also used gate mechanism for enter the car. The main purpose of gate mechanism to reduce manpower. This system we specially designed for security purpose.

Keywords: RFID, RFID Tag , Gate mechanism, IR sensor

1. Introduction

In the modern world everything is going automatic. We built a system which automatically debit amount for public places and enters car in parking area through gate is handled in fast manner so it reduce wastage of time. In any parking system searching for parking system is always difficult process. Hence need this system which can help to find vacant slot using RFID and IR sensors. RFID technology is very useful technology in this automation. The slot availability details are collected using RFID and IR sensor system and updated periodically into database and displayed on LCD. In the concept of automatic car parking system controller which is used to sense the movement of car and at a same time through RFID cards we identify users information legal or illegal, depending upon users information gate door open or remain close and amount is debited or not. If all user information is matched then car enter in parking space and at same time amount will be debited if it is in public areas.

2. Literature Survey

K. Sushma et al[1], has done Reservation based vehicle paking system using GSM and RFID. It overcome problem of unnecessary time consumption in finding parking spot. In this we can reserve parking slot by sending SMS to GSM placed at parking end.

S.C.Hanche et al[2],has done Automated vehicle parking system using RFID. This project implemented an automated vehicle management system using RFID. It enhanced utilization of parking space & help user to check availability of parking space and enhance security.

Banka Bala N L Vara Prasad et al[3], has done Automatic Parking. This project indicate the unfilled parking space by particular shining LED to avoide blocking of vehicle using IR sensor and LPC2148.

Rahul Kadam et al[4], has done Automated gate control of animal cage using Arduino. The system contains animal cage and electronic system which make the cage system automated which reducing manually controlling of door and reduce risk of person by using aurdino.

3. Hardware Implementation

The Heart of system is AVR controller and other component used RFID, IR, DC Motor, RFID tag. AVR controller interfaced with RFID module, IR sensor and Gate mechanism. Using RFID technology car enter in parking area and amount only for public places and for private it is free of cost. IR sensor which detect availability of parking slot. DC motor is used to drive gate

mechanism. LCD display which parking slot is empty to give information to user for park the car in vacant slot. Main purpose of this system is provide security.

3.1 RFID Technology

Fig.1: RFID Module

RFID stands for Radio Frequency Identification. RFID is one member in the family of Automatic Identification and Data Capture (AIDC). Technologies and is a fast and reliable means of identifying of objects. RFID reader which transmits and receives the signals. Communication between RFID readers and tags occurs wirelessly and generally does not require line of sight between the devices. This system also consist of RFID readers it is mainly used to record user information. The information recorded in the tag is transmitted to the RFID reader. The data can from RFID Reader can be read and interfaced by AVR controller. The tag contains distinct information about the car, like employee ID number or name or any other distinct data. This step accomplishes the data feed to the tag. Reading from the tag, the information from the tag needs to be read during the car parking. In this step, the data is read from the tag with the help of an RFID reader.

3.2 IR Sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measures the heat of an object as well as detects the motion. This types of sensors measures only infrared radiation, rather than emitting it is called as a passive IR sensor. These types of radiation are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR led (light emitting diode) and detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR led. When IR light false on the photodiode, the resistance and these output voltages change in proportion to the magnitude of IR light received. An infrared sensor circuit is one of the basic and popular sensor module in an electronic device. This sensor is analogous to humans visionary senses, which can be used to detect obstacles and it is one of the common application in real time.IR sensor placed at every parking slot to monitor its status in real time i.e. if it is empty or filled .It passes this input to controller which then proceed to provide information to display of vacant slot for parking and control of gate.

3.3 DC Motor

A DC motor usually means a permanent magnet direct current motor of the sort used in toys, models, Robots and cordless tools. These Motors are particularly versatile because both their speed and direction can be readily controlled speed by the voltage or duty cycle of their power supply and direction by its polarity. DC motor is used to open and close the gate. It is interfaced with ATmega16controller and takes command from the controller to rotate for opening and closing of door. Torque is measurement of the motors powers. The higher the torque of the motor the more weight it can move. The DC motors provides different amount of torque depending on their running speed, which is measured in RPM (revolution per minute). That's why we have to use gears to reduce the overall speed of the motor.

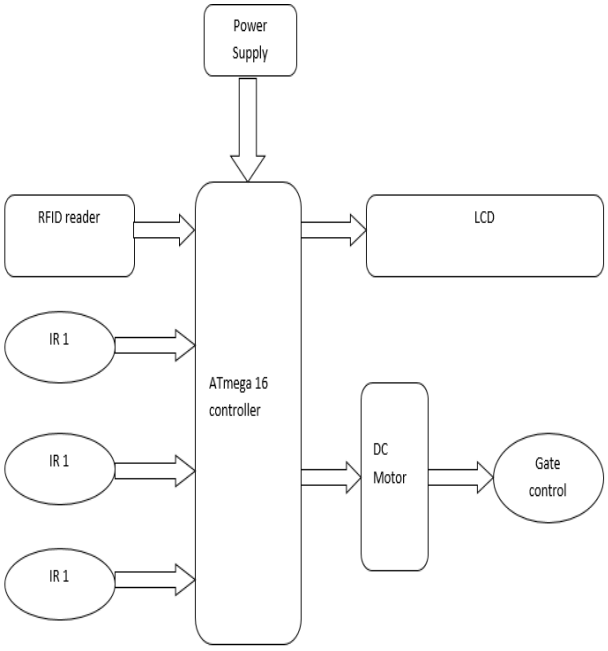

Fig.2 Block diagram of car parking system

4. Circuit Description

The block diagram of automatic car parking and gate control system is as shown in figure. AVR is brain of RFID Reader module whole system and RFID is heart of system. In this system we use EM- RFID module. It is placed in front of gate. RFID sense and detect all user information and send to controller. It reading distances the upto100mm. And it's operating frequency 125 kHz. In this system we use infrared sensor is proximity sensor.IR sensor sense object upto20cm. IR sensor detects presence and absence of vehicle. Send this information to AVR controller.

In this system Power supply activate the circuit by supplying power to AVR controller and other circuit component LCD, IR, RFID Module operate at 5v supply. AVR controller continuously monitors all parameter in the circuit. When user Arrives at the gate in parking area then RFID Reader read RFID tag and check information of the user legal or not. If information is legal then it send controller. RFID tag contained electronically information like name of user, car number, credit amount. In this prototype we use 3IR sensor to for 3 parking slots.

The position of IR sensor placed at each parking slot. It detect the object upto20cm vehicle is present or absent. If object is available then it sends information to controller and using LCD it display which number of parking slot is available. Controller gives signal to DC motor to drive the gate at the same time. DC motor mechanism drives by L293d motor driver IC to open gate. When gate is open then user park the vehicle in available slot. This project is distributed in public and private sector.

The advantage in private sector like college campus, office members, it is free of cost for user. And in public sector such as shopping malls, cinema theatre, sports stadiums amount will be debited according to their time duration.

Flowchart

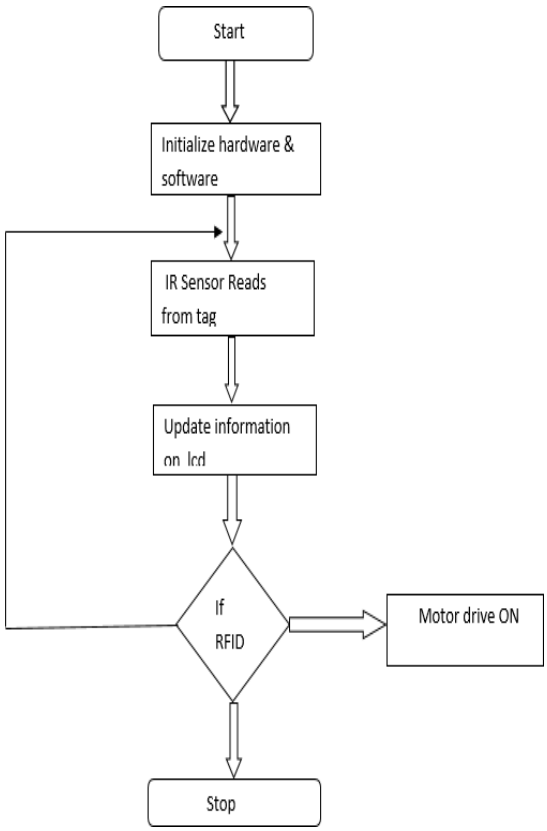

Fig. 3 Flowchart of proposed system

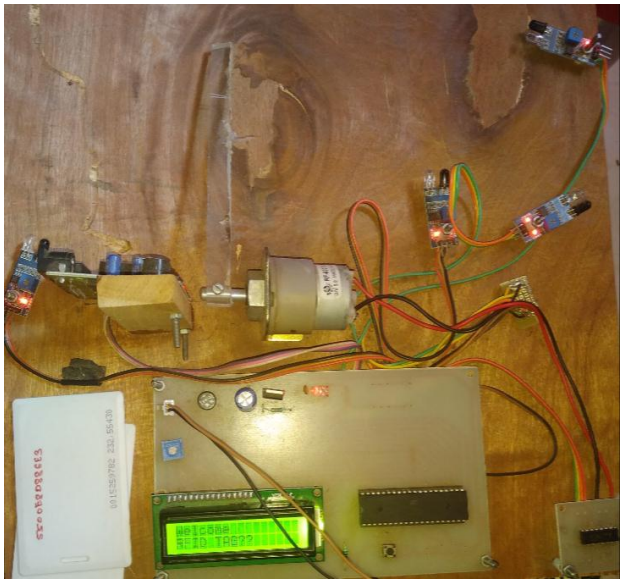

Fig. 4 Hardware Set-up

Advantages

1. Eco-friendly.
2. Increase security within parking system.
3. Accurately identify and authorize vehicle movement.

Application

1. It is used in pay and park place.
2. It is used in market space, cinema theatre, and industrial space.

Conclusion

The automatic car parking system can control parking automatically by sensors. These system helps user to reduce waste time for searching for parking slot and it is displayed on LCD which parking slot is available to user. Recently the circuit can be used at all places from domestic sector to the industrial sector. The simplicity in the usage ,this circuit help to be used by large number of people ,people with less knowledge of this system they can also handle it without facing any problem.

References

[1] K.Sushma, P.Raveendra, Babu, J. Nageshwara Ready, "Reservation Based Vehicle Parking System Using RFID Technology International. Journal of Engineering Research and Applications, Volume 3, Issue 5, September-October2013, pp.495-498.

[2] S.C.Hanche, Pooja Munot, Pranali Bagal, Kirti Sonawane, Pooja Pise, "Automated Vechicle Parking System using RFID",ITSI Transactions on Electrical and Electronics Engineering Volume 1,Issue- 2,2013,pp.89-92.

[3] BankaBala, N.L.Vara, Prasad, B.Lakshmi, Prof. K. Ramakrishnaiah, "Design Implementataion of Automatic Vehicle Parking System", International Journal of Applied Sciences, Engineering and Management Volume 05,No.01,January 2016,pp.47-50.

[4] Rahul Kadam, Ruchika Shelke, Pritesh Bagade, Shradha Dongare, "Automatic Gate of Cage Using Arduino Mega 2560 ",International Journal of Engineering Science and Computing,Volume 8,Issue No.3,March 2018,pp.16204-16206.