PARKING AVALABILITY PREDICTION AND AUTOMATIC PARKING SYSTEM

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ABSTRACT

In busy traffic areas parking vehicles by searching for empty spaces is major problem. Nowadays parking system are equipped with sensors and microcontroller to automatically count the cars .This parking system may not indicate any empty space and very expensive, long processing time and large energy consumption. The existing system aren't completely automated and need some level of human interference. The proposed system is fitting for multi-floor building and send a message to vehicle about the status of parking slot. The difference between proposed and existing system is that aim to construct our system as less human dependent as possible by automating the cars .This proposed system that helps users automatically find empty parking space .

Keywords: *ARDUINO Microcontroller, IR sensor, Bluetooth, smart phone, DC motors, java.*

I.   INTRODUCTION

The development of traffic management system, an advanced parking system was created to hiring people and optimal use of resources. General method of finding a parking space is physical. This method takes time and effort and lead worst case of failing to find parking space. A wireless personal area network mean on the way to span. The solution for parking problem, which take in the fuel consumption and pollution ,it

minimized by carry out the system using mobile. In this project we implement the system with smartphone, IR sensor, ARDUINO microcontroller, Bluetooth, DC motor. This system check the parking availability in multi-floor using IR sensor the decision may be made by ARDUINO microcontrollers. Aim of project is to automate the car park for allowing the cars into the parking slot. The status of parking slot send to the LCD display . Several automobile research

institutes and fabrication are increasing automatic parking system.

Two basic modules are required for implementation of this system

    1. Parking availability prediction system

    2. Automatic car parking

The following software are used in this project

    1. Arduino IDE

    2. Android Studio IDE

    3. Virtual Terminal

The aim of this project is to provide an efficient car parking system with minimal human intervention.

II.   LITERATURE SURVEY

Several methods are established for improvement of independent or intelligent parking system. Study of these system shows that these system need a little or more human involvement for the working.

One of the smart system for car parking has been proposed by creating use of Image processing[1].In this model , a brown smooth-edged image on the parking slot is captured using camera and see to detect the free parking slot. The data about the currently unfilled parking spaces is displayed on the 16*2 display. First , the image is segmented to create binary image and noise is removed then object boundaries are identified. The image detection modules determines which object is round using each object's area and perimeter. Accordingly ,the free parking space is allocated.

A vision based car parking system[2] is developed which uses two kinds of images to detect empty parking slot. In this work , the object classifier detects the required object within the input. Positive image contain car image from several angles. Negative image do not have any cars in them. Limitation may occur with this system detail to the type of camera used. Limited set of positive and negative images can place limitation on the system.

Smart parking system[3] planned proposed a mechanical model with an image processing facility. The vehicle would be parked by the help of lift at several level.

III.   IMPORTANT COMPONENTS

Some important components , helpful to understand the proposed systems are explained in this part.

1.ATMEGA-328P Microcontroller:

It is one of the type of microcontroller. ARDUINO board is used for construct the whole setup. ARDUINO is a open source controller so we can go for that purpose. The instruction are write in ARDUINO using JAVA language. ARDUINO due to it's high performance and low power consumption gained their interest in processor field. The following reason ARDUINO are mostly preferable ,it's very flexible, easy to use and inexpensive.
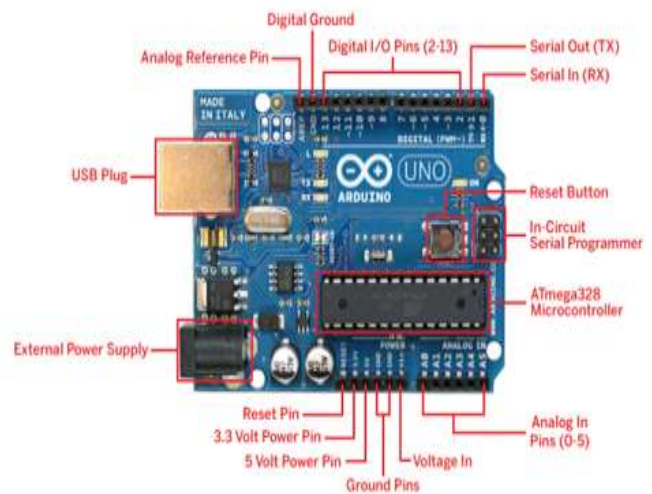
2.IR Sensor :

Infrared sensor are used to check the vehicle parking space status. More electronic system need control system and response for more application. These are basically tuned to listen to infrared light. The objects emit heat energy in the form of radiation which can be detected by electronic devices and it is invisible to human eye. If any object is find out then the IR light will be replicated and some of it will hit the indicator and thus knows whether the empty space is available for parking.

3.DC Motor:

DC motor is used to convert DC supply to mechanical power. The speed of DC motor is very high and very cheap. The design of DC motor is also very simple.
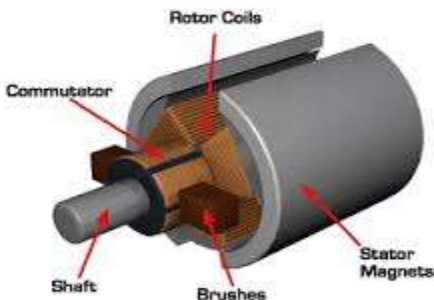
DC motor driver IC is used for control the direction of vehicle. It is an integrated circuit chip which is usually used to control the DC motor in autonomous robots. These IC is designed to control two DC motors simultaneously. It consumes only low power, low voltage.
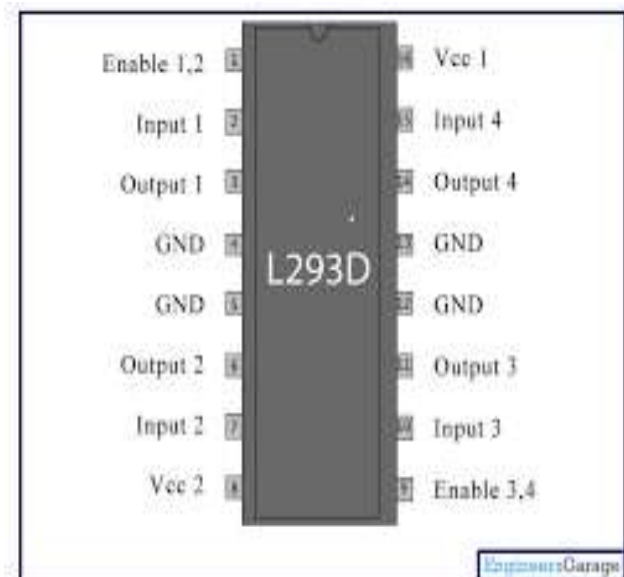
4.Bluetooth:

It transmits data via low power radio wave. Frequency range of Bluetooth is 2.45GHz. It is used to transfer the data such as photo, video, files. Bluetooth protocol stack size is 250 KB.

IV.   PROPOSED SYSTEM

The smart vehicle bays system is a terrific technology in automobile field. Proposed system is a smart vehicle parking using IR sensor. IR sensor is used to get the status of empty space. We aim to improve an

autonomous vehicle parking system which is instructed using Android application and thus offer an efficient car parking system.

The proposed system contains two modules: Parking availability prediction system, Automatic parking of the vehicle system. The parking availability prediction system is placed in parking slot and automatic parking system placed at vehicle.

A.PARKING AVAILABILITY PREDICTION SYSTEM

This system is placed at parking slot .In this system IR sensor, ARDUINO microcontroller, LCD display are available.IR sensor is placed at parking slot which is send the information to microcontroller about the obstacle is present or not. Interfacing of microcontroller with LCD unit is used for displaying the parking slot status data to user. LCD display is placed at main gate. Input of this system is 12V.LCD display is design to indicate the status of slot using register select and enable. C program is write for LCD display indication about status of the parking space. So LCD mentioned there is empty space is available or not.
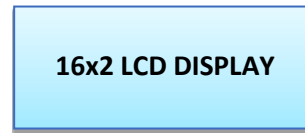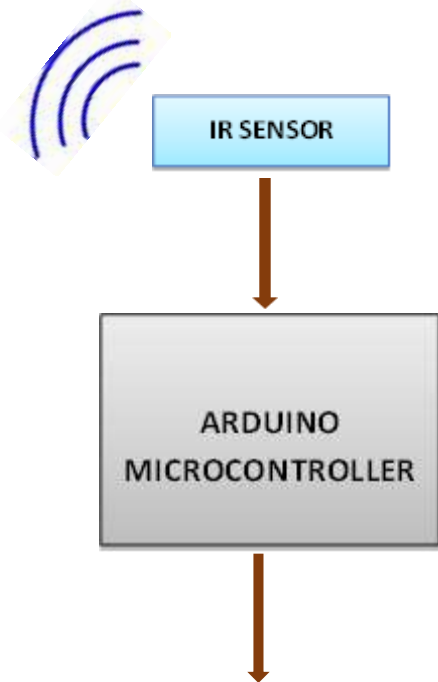
16x2 LCD DISPLAY

Fig 1 : parking availability prediction system

B.AUTOMATIC PARKING OF THE VEHICLE SYSTEM

This system mention how the vehicle will be automatically placed in empty space. In this system contain ARDUINO microcontroller, IR sensor, DC motor, DC motor driver IC, Bluetooth, Smartphone. When empty space is predict then user want to park the vehicle in automatic manner. Bluetooth is paired from mobile to vehicle. Then press on button in mobile the vehicle is move towards the empty space. Android application is used to give the instruction to vehicle for automatic parking.

DC MOTOR

ARDUINO   DC MOTOR DRIVER IC   IR SENSOR

BLUETOOTH WIRELESS

IN-BUILT BLUETOOTH

Fig 2 : automatic parking of vehicle system

IR SENSOR

ARDUINO MICROCONTROLLER

For the path identification IR sensor is used in this method. They detect there is any obstacle is present or not.IR sensor , DC motor and DC motor driver IC are interfaced by microcontroller. DC motor is used for select the direction for moving. The program for DC motor operation is write in DC motor driver IC. The ARDUINO consists of input , Bridge rectifier, capacitor, 7805 Voltage regulator and Crystal oscillator. In this application L293D type of DC motor is used.

Finally the proposed system may identify the parking availability and park the vehicle by automatically. If there is empty space available , then it send as a message like ''filled''. So user can understand the status of slot and takes a decision for parking which saves time, fuel, reduced pollution effect. This proposed system can be extended to any number of floors.

V.   EVALUATION

The proposed system is simulated by using JAVA. The JAVA has many function and many modules that can be easily implemented. The major thing in this system is to find parking space at any malls, hospitals, offices, public transport areas. This system makes the reliable and it runs with low maintenance.

VI.   CONCLUTION

Nowadays implemented sensors and microcontrollers in some parking lot systems only count the cars parked in the slot but it can't detect the empty space. Develop a smart vehicle parking lot using smart phones ,ARDUINO microcontroller, IR sensor ,Bluetooth.

The proposed system can be implemented in the future vehicle and can be used to avoid the traffic problem in heavy parking areas. This system save the time in searching a place.

REFERANCE

1. M.Ataur Rehman, M.M. Rashid, A.Musa, A.Farhana and   N.Farhana,"Automatic parking management and parking fee collection based On Number Plate Recognition", International Journal of Machine Learning and Computing, vol. 2, no. 2, pp. 93-98, 2012.
2. Patrick Sebastian, Hamada R.H. Al-Absi, Justin Dinesh Daniel Devraj and Yap Vooi Voon, "Vision based automated parking System", 10th International conference on Information Science, Signal Processing and their Applications (ISSPA 2010), no. 1, pp. 757-760, 2010.
3. Norazwinawati Basharuddin, R. Yusnita, Fariza Norbaya,"Intelligent Parking space detection system based on image Processing", Internation Journal of Innovation,   Management   and Technology, vol. 3, no. 3, pp. 232-253, 2012.
4. M.A.R. Sarkar, A.A. Rokoni, M.O. Reza, M.F. Ismail, "Smart Parking system with image processing facility", I.J. Intelligent Systems and Applications, 2012, vol. 3, pp. 41-47.
5. Adamu Murtela Zungeru, Ufaruna Victoria   Edu, Ambafi James Garba, "Design and implementation of Short Message   Service   based   Remote Controller", Computer Engineering and Intelligent systems, ISSN 2222- 1719

(Paper) ISSN 2222-2863 (Online), Vol. 3, no. 4, 2012.

6. Crossbow Technology, "IRIS Datasheet," [Accessed Feb. 2, 2011]. [Online]. Available: http://bullseye.xbow.com:81/Products/Product pdf files/Wireless pdf/IRIS Datasheet.pdf

7. MEMSIC, "MTS420/400 Datasheet," [Accessed Oct. 14, 2014]. [Online]. Available: http://www.memsic.com/userfiles/files/Datasheets/ WSN/mts400 420 datasheet-t.pdf

8. Pala Z., Inanc N., "Smart Parking Applications Using RFID Technology", 1st Annual Eurasia RFID Conference, September 2007, Turkey.

9. QuickPark Official Website, http://www.quickpark.ie

10. ParkWhiz Official Website, http://www.parkwhiz.com

11. SIPARK PMA Press Release, Siemens Corporate Website, http://w1.siemens.com/press/en/pr_cc/2007/06_jun/is05076241e_1451 454.htm

12. Communications and Multimedia Selected Facts and Figures 2008, Malaysian Communications and Multimedia Commission, Cyberjaya, 2008, ISSN 1675-6223, pp 15-38.

13. Specialist System Engineering (SSE), Official Website, http://www.sse.co.za

14. Friedhelm Hillebrand, ed.: GSM and UMTS, The Creation of Global Mobile Communications, John Wiley & Sons, 2002.

15. Clint Smith, Daniel Collins, 3G Wireless Networks, McGraw-Hill Telecommunication Series, September 2001, pp. 136.