Survey of Smart Parking System Enhanced with Current Technology

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ABSTRACT

In the recent days, some parking lot systems are equipped with sensors and microcontrollers to automatically count the bikes parked in the lot. However, No such a parking system introduced for two wheeler vehicular parking system. The proposed system is suitable for sense the status of parking spaces. We can fix the smart device on two wheeler which displays the free or available slots on bike parking system and also provide a navigation system to display the dynamic updates on each parking slot. The central unit system continuously collets the data from parking unit and then it intimates the hourly message to the user about the tariff.

Keywords : Parking Lot, Dynamic Updates, RFID, IR Sensors, Display.

I. INTRODUCTION

Now-a-days we are all suffer a lot due to heavy traffic in busy areas but there is no controller system to manage the two wheeler vehicular parking system in India. In this paper, it focus on providing a smart device to display the parking slot with its total count and average count of two wheelers parked in a slot. While entering into the parking slot, it could displays about the exact location of ach parking slot as it nearby and also update their information as periodically.

Recently introduced RFM 75 technology is a low-cost and low-power wireless communication protocol targeted towards automation and remote control applications. In this work, we propose a smart parking system for heavy traffic environments using RFM 75 wireless transmission Module, RFID and IR sensors. The central unit system continuously collets the data from parking unit and then it intimates the hourly message to the user about the tariff.

Objective

Our project aim is to reduce the difficulties in large and busy traffic areas parking vehicles by searching for empty (and available) spaces and provides smart technology to the parking system.

II. METHODS AND MATERIAL

A. Literature Survey

[1] SPS Architecture Using Ultrasonic Detection, Kianpisheh, Norlia Mustaffa, Pakapan Limtrairut

- Proposed Work : parking space could be detected using ultrasonic sensors.
- Future Work:
 (i) Adopt the sensitivity to temperature changes.
 (ii) Doesn't affected by extreme air turbulence.

[2] Reservation-based smart parking system , Hongwei Wang and Wenbo He

- Proposed Work : system can works after receiving the confirmation on users at its arrival time.
Reservation scheme is affected the change on physical parking system.
- Future Work : To manage the physical and database of the system driver.

[3] Intelligent Parking Management System Based on Image processing, Hilal Al-Kharusi, Ibrahim Al-Bahadly

Proposed Work : single camera helps to detect the presence of multiple vehicles at a time.

Future Work : weather conditions should affect the changes on parking slot.

[4] A Multi-Classifier Image Based Vacant Parking Detection System , Junzhao Liu, MohamedMohandes,

- Proposed Work : robust empty slot detection system and low cost for computational work.
- Future Work : weather condition should affect the visibility.

Year	Paper names	Advantages	Disadvantages
Dec-2014	A Convenient Vision-Based System for Automatic Detection of Parking Spaces in Indoor Parking Lots Using Wide-Angle Cameras , Shen-En ShihandWen-Hsiang Tsai	1. The system can be set up easily by a common user with no technical background. 2. A wide-angle cameras are used to cover the whole area of the parking lot 3. Parking spaces can be detected precisely.	1. No measures provided to deal with the weather condition which can affect the visibility. 2. Reservation is not provided in the system. 3. Cameras should be in a position where it's possible to monitor the whole parking lots.
Dec-2014	Automated Car Parking System Commanded By Android Application , Mrs. D.J.Bonde,RohitSuniKetan Suresh Gaikwadl Shende	1. The system is automated which relieve human dependence. 2. Android system is applied as a current technology.	1. A driver has to wait at the parking gate for identification of vacant lot. 2. No reservation of parking lot which can facilitate car owners to save time.
Feb-2015	An Automated Vehicle Parking Monitoring and Management System Using ANPR Cameras, Mohammed Y Aalsalem, WazirZada	1. Automatic number plate recognition cameras are used to effectively manage monitor and protect the parking facilities. 2. Android application is used	1. No facilities for searchers of vacant parking space. 2. The system is limited in short distance since it doesn't give any information to the
Aug-2015	Design and Management of an Intelligent Parking Lot System by Multiple Camera Platforms,Chieh-	1. Lend the drivers to record their parking spot number and location easily. 2. Provides remote end monitoring and offer parking spot leading	1. Update rate of the parking spot may be slow during high traffic load. 2. Raspberry pi needs more extension for upholding more features as per this system.
Oct-2016	Park Here! A Smart Parking System based on Smart-phones' Embedded Sensors and Short Range Communication	1. It's cheap since it doesn't require infrastructure. 2. Easy communication due to android application. 3. The application is simple to be used in a participatory way.	1. It's only used when the two uses are in the same proximity area. 2. No reservation is provided in system. 3. Access to geo-location of the

B. Problem Identification from Existing System

✓ In existing systems are very expensive and suffer due to long processing time and large energy consumption.
✓ Only the total number of parking slots and free parking slots are made visible at the entrance of the multi-level parking.
✓ It's very difficult to find the free parking slot among thousands of slots in the multi level parking.

✓ There is no reservation system available.
✓ It's more time consuming process to find the free slot for parking.

C. Proposed System

✓ In this work, we propose a smart parking system for heavy traffic environments using WI-FI module and IR sensors. Here we are using area android mobile to select the area in which the car has to park.

- IR sensors are used to detect the car present in the particular slot.
- If any parking slot is free or available in the particular area then this information will update in the server database through WI-FI.
- The user can send the request to server regarding the available parking slot which will be displayed in the user's mobile web page through WI-FI. From this user can park the car in the available area without any disturbance.

D. Advantages

- It provides the facility to the user for reserving the slot while entering in to the parking.
- Very less time consumed as compared to the existing system.
- Fuel consumption can be very much reduced.
- Parking system can be managed very efficiently.
- The proposed system reliable and thus it is an advantage as it runs with low maintenance.

E. Hardware
- PIC microcontroller
- IR sensor
- Keypad(Area Selector)
- LCD

F. Software
- CCS Compiler
- Microsoft Visual studio

G. Language
- HTML/CSS
- C#
- Embedded C

H. RFID

Radio frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source such as a battery and may operate at hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).[1]
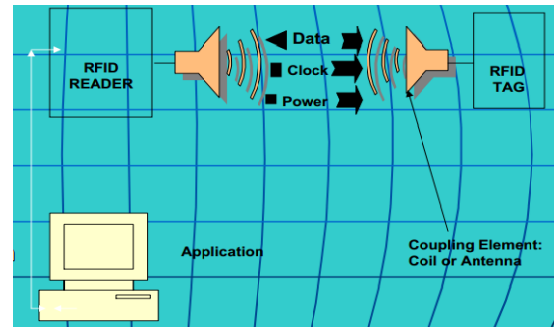

Figure 1. RFID System

RFID tags are used in many industries, for example, an RFID tag attached to an automobile during production can be used to track its progress through the assembly line; RFID-tagged pharmaceuticals can be tracked through warehouses; and implanting RFID microchips in livestock and pets allows positive identification of animals.

I. IR Sensors

IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum.

By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold.
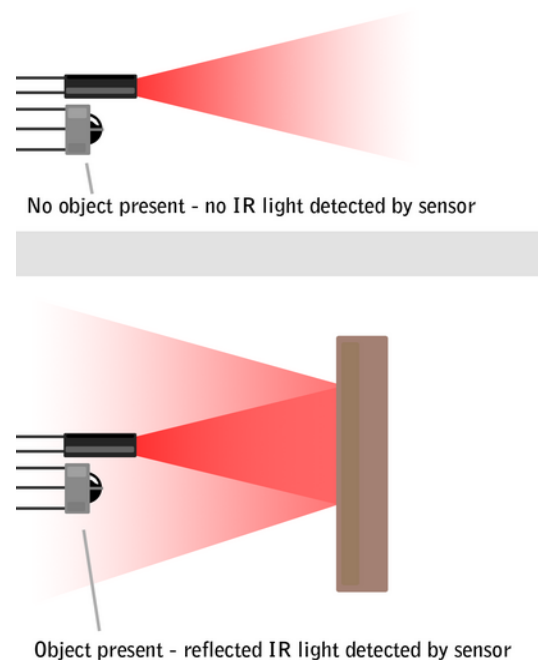

No object present - no IR light detected by sensor

Object present - reflected IR light detected by sensor

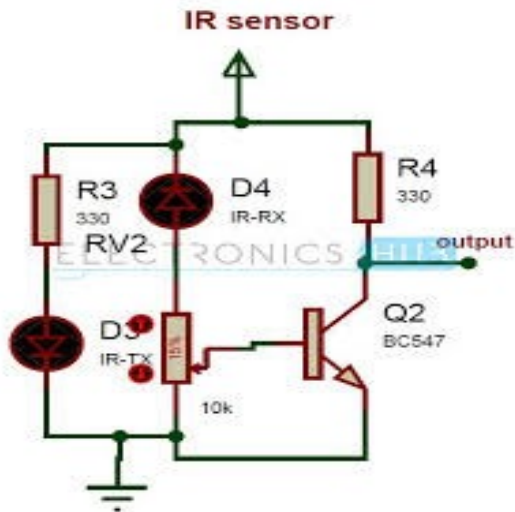**Figure 2.** IR Sensor detector

IR sensor

Figure 3.
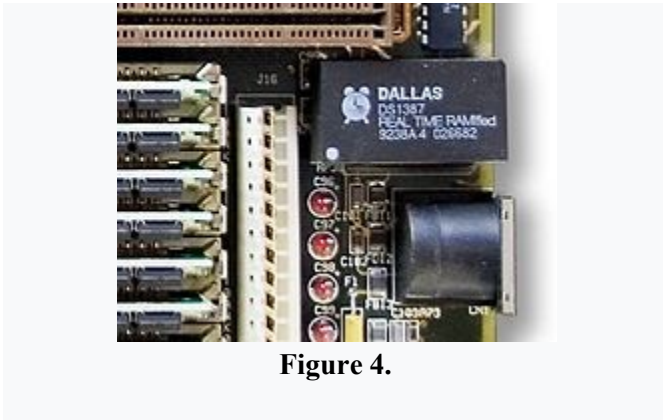
J. REAL TIME CLOCK

Figure 4.

Dallas Semiconductor (DS1387) real-time clock from an older PC. This version also contains a battery-backed SRAM.

A real-time clock (RTC) is a computer clock (most often in the form of an integrated circuit) that keeps track of the current time. Although the term often refers to the devices in personal computers, servers and embedded systems, RTCs are present in almost any electronic device which needs to keep accurate time.

K. LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly.[1] LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as

in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

Figure 5. Lcd display

LCDs are used in a wide range of applications including computer,monitors, televisions, instrumenght panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in portable consumer devices such as digital cameras, watches, calculators, and mobile telephones, including smartphones. LCD screens are also used on consumer electronics products such as DVD players, video game devices and clocks. LCD screens have replaced heavy, bulky cathode ray tube (CRT) displays in nearly all applications. LCD screens are available in a wider range of screen sizes than CRT and plasma displays, with LCD screens available in sizes ranging from tiny digital watches to huge, big-screen television set.

III. CONCLUSION

In the recent days, some parking lot systems are equipped with sensors and microcontrollers to automatically count the cars parked in the IOT.

However, No such parking system introduced for two wheeler vehicular parking. The proposed system is suitable for sense the status of parking spaces. we can fix the Smart device on two wheeler which displays the free or available slots on bike parking system and also provide a Navigation system to display the dynamic updates on each parking slot.

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