(IOT) BASED REAL TIME PARKING SYSTEM USING ARDUINO AND BLYNK APPLICATION

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Abstract: Parking scarcity is one of the critical solutions is to provide to be had on parking with smart parking systems. As the number of people increased, the number of vehicles on the road also increased significantly. This causes traffic congestion to be delayed in finding a parking space, leading to roadblocks and pollution. This paper offers the use of sensors and android apps in a smart parking system using algorithms. IR sensors are used to sense the position of the parking space. Blynk application algorithm techniques are used to find the nearest and most suitable parking space that is unoccupied and occupied by people. With the help of the sensor and Blynk application, parking spaces can be viewed from anywhere. The sensor is used to detect car detection in Slot. These IR sensors are connected to Arduino. Whenever a car is parked in a building, the Arduino sends a command to the IR sensor, and these sends the command to the Blynk app.

Keywords: smart parking, Internet of Things, Wireless Sensor Network, Blynk application, infrared sensor, Authentication

I. INTRODUCTION

In this contemporary virtual generation nearly all people has smart phone to make sure that there may be no want for extra hardware in consumer interface. In general, city towns have as a minimum one motor automobile they are able to without difficulty pay for the automobile. Therefore, mores parking troubles have passed off in city towns. It leads to the problem for parking spaces which causes heavy traffic, and much pollution. This is the problem we are facing in many cities today. Vehicle drivers waste most of their time for finding the available parking slots. In further sections we are going to have a look at the demonstration of how to decrease these parking problems and to-do efficient cloud-based parking service. Traffic management system in many urban areas has been implemented and launched a new parking guidance which is Parking Guidance and Information (PGI) technology for good parking. IoT enables to construct the world's biggest city groups at a fantastic speed & also an integrated car parking system. The scheme target to increase a vehicles device that detects the auto slot quantity the use of a reputation detection approach to increase a parking app for parking free. In this paper we are using some blink application. In this manuscript we discuss about the protection of authentication which is a part of internet security. As rapidly booming the population in urban areas almost every citizen using vehicles. This technology convey us the transactional data about parking in smart cities. The manual parking guidance system has several shortcomings such as, extremely costly to maintain the parking system, time to consume produce results, duplication of data entry.
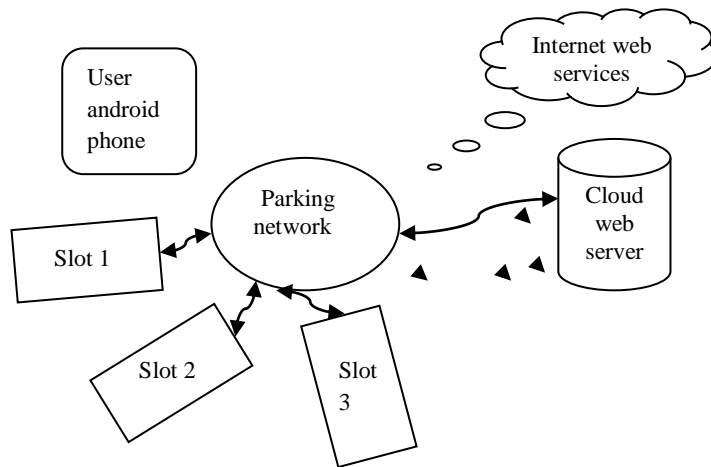
Fig:-1.1 Real time parking network

II. BACKGROUND STUDY

Many investigators in their various occupations have largely addressed the problem of using reliable parking and security (PGIS) methods, by finding vacant parking lots and passing such information on to car owners. Existing functions can be broadly divided into two areas, Wireless network-based systems and Camera-supported systems.

In [1], monitoring of empty space is performed by the end user and monitoring environmental conditions, where light and temperature are performed by an authorized person. Infrared sensors are used when indoor parking and ultrasonic sensors are used when outdoor parking is available. Light and heat are obtained by binding according to the action of light and heat respectively.

In [2], vehicles are detected using ultrasonic sensors. The program uses a supervised learning algorithm to find stationary and empty parking spaces.

In [3], Automatic number plate camera is used to effectively manage, monitor and protect parking spaces, Android application is used to make it easier for drivers to remember their parking space, however, There are no private parking detector centers, details for incoming drivers about the current state of parking spaces.

In [4] Intelligent parking using IoT technology helps design and build up a real parking system that provides information on vacant spaces and helps the user.This paper uses a computer view to find a vehicle number for security improvements.

In [5], parts of a good parking system are a parking meter,Wi-Fi enabled laptop.The parking meter contains ultrasonic sensors to determine the position of the seat in the parking lot, an alarm IC is used for improper parking. A motor vehicle license plate is also obtained using a camera.

In [6], the Hough circle modification is applied to images to determine the number of unused parking spaces. Hough modification is used for shape detection. This system is designed specifically for four wheels.

In [7], smart parking systems have a magnetic sensor with transceiver 802.15.4, which is used to detect the number of empty parking spaces. Gates collect this information and send it to an Internet server. Zigbee is used for wireless communication. Parking can be booked in advance. System performance is performed using a genetic algorithm.

In [8], an ultrasonic sensor is used to locate the parking space. The mobile app and online portal are being upgraded to display the number of vacant sites. Users can save the parking space in advance and pay for it. Users are provided with a barcode to enter the parking lot with an automatic collection. Offline users can provide cash at the time of login.

In [9], vehicles are exposed to ultrasonic sensors. The ultrasonic sensor is made of smart hardware to enable a simple computer and transmit information at the gate via RF. The method is also prepared using the algorithm.

In [10] their study they proposed to prove the authenticity of the IoT base using a Received Signal Strength (RSS) system based on proximity detection.

III. PROPOSED ARCHITECTURE

IOT based car parking system using arduino and blynk application has following two major sections. They are as follows:-

1. Section consists of IR sensor, LCD 16X2, Servomotor, led or buzzer connecting with jumper wires all of these connected with arduino. Hence whenever the car gets into the parking slots IR sensor detects the presence of car and sets its output to high and sends it to the arduino board.

2. Section consists of blynk application which is used to acknowledge about the availability of free parking space. With the help of this application user can know about the parking slot availability from the remote area and all of them should be controlled by the blynk application.

3.1 Hardware Requirement

The different hardware's required are: -

1.) Arduino Uno R3 is considered as an open platform used to build a wide range of electronic and internet projects. The Arduino Uno R3 can be a microcontroller that contains both physical and structured PC operating systems.

Fig: 3.1:-Arduino Uno

2) The infrared sensor is an output device that detects certain environmental features. The IR sensor can be measure the temperature of an object more as it detects movement.
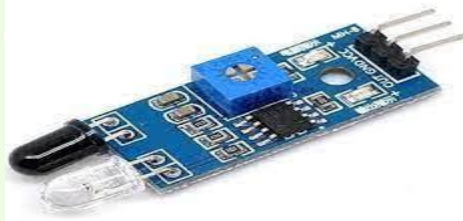

Fig: 3.2 IR sensors

3) The Servo car is recognized to represent the gate of the system's barriers, and finding the presence of a car near the entrance system. In this project, a servo motor is connected to the Arduino Uno R3 to represent as an entry barrier. After the car verification, the barrier gate is manually opened by the controller with an app that will only be accessed by the controller.
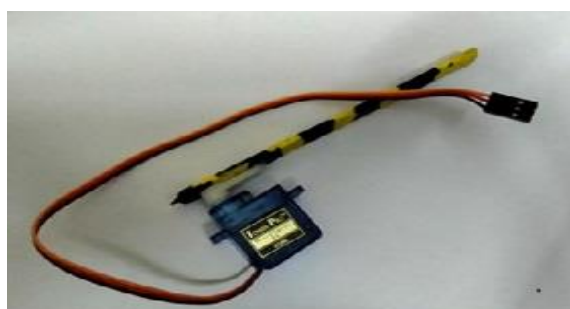

Fig:-3.3servomotor

4) Liquid Display (LCD) is an electronic display module which is used in circuits when translating 16-character displays in each of the two such lines. The LCD is placed on board and connected to the Arduino Uno R3. With the purpose of displaying user parking fees balance from the android app.
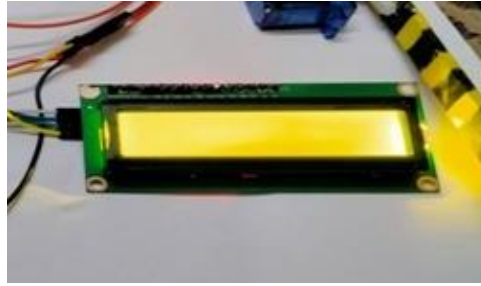

Fig:-3.4.16x2 LCD DISPLAY

3.2 Software Requirement

1) Arduino IDE: This software makes it very easy to write and upload code to the Arduino UNO board. The code is is based on open source software. The code was uploaded to the Arduino Uno board using a USB cable. Arduino IDE supports C ++ languages using special coding rules.

2) Blynk Application: Blynk is the most popular IoT platform for connecting your devices to the cloud. It is known for allowing users to design apps to control their IoT devices, analyze telemetry data, and manage your scaled products. Blynk is a platform where we can upgrade an Android IOS operating system user. The user gets information about parking through the blynk Application can control the hardware remotely, can display sensor data, can store data, and visualize it. Blynk is a new platform that allows you to quickly build ways to control and monitor your hardware projects from your IOS and Android device. After downloading the blynk app, you can create a project dashboard and edit buttons, slides, graphs and other widgets on the screen.

Blynk Cloud & Blink Libraries:-The major control & connections for mobile & other devices. We can either use built in cloud. It will turn on the association with the server and procedure every single approaching datum. Consider here when you press an on or off catch in the blynk application, the information will be made a trip to the blynk Cloud that data will be reflected in your equipment. Some blynk features area as follows: -

1. Some application programming data and UI for all gadgets can associate through Association with the cloud utilizing like wifi, Bluetooth, Ethernet, USB etc set of simple to-utilize widgets like led, buttons
2. Very simple to associate and include new ranges by utilizing virtual pins. History information checking by means of super chart gadget.
3. Hardware-to-Hardware direct correspondence by utilizing Bridge Widget like sending messages and soon. It provides GUI to the user.
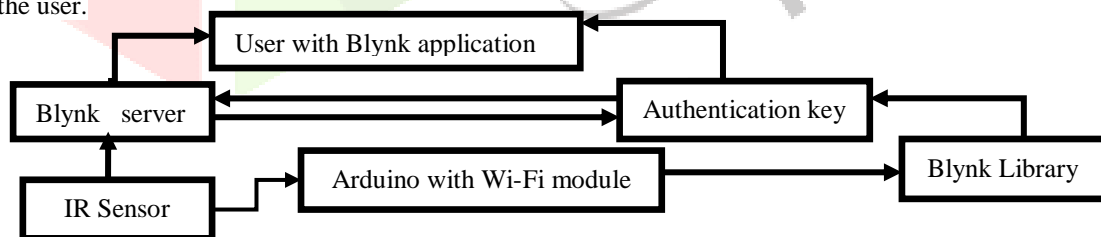

Fig:-3.5 Proposed System Wireless Sensor Network

IV.IMPLEMENTING

In this the sensor is activated   in the parking lots to find cars and send this data to the server and also find out how many empty spaces in a particular parking lot. There are a few steps involved in this process: -

4.1 STEPS OF ONLINE PARKING SYSTEM

STEP 1. First of all we install the app then check the parking availability and find a quick route to the parking lot.

STEP 2. After checking the route we book the slot by hand and find our car in the parking slot and go to app or websites and login it and booked a slot.

STEP 3. After booking the slot, information received through user such as registration number and message relating to user booking details.

STEP 4. After getting registration details and booking a slot the user access with led light and token in the parking lot.

STEP 5. Thus at the time of the user's exit access to the led light and payment is deducted automatically. In this way online parking system has been designed.
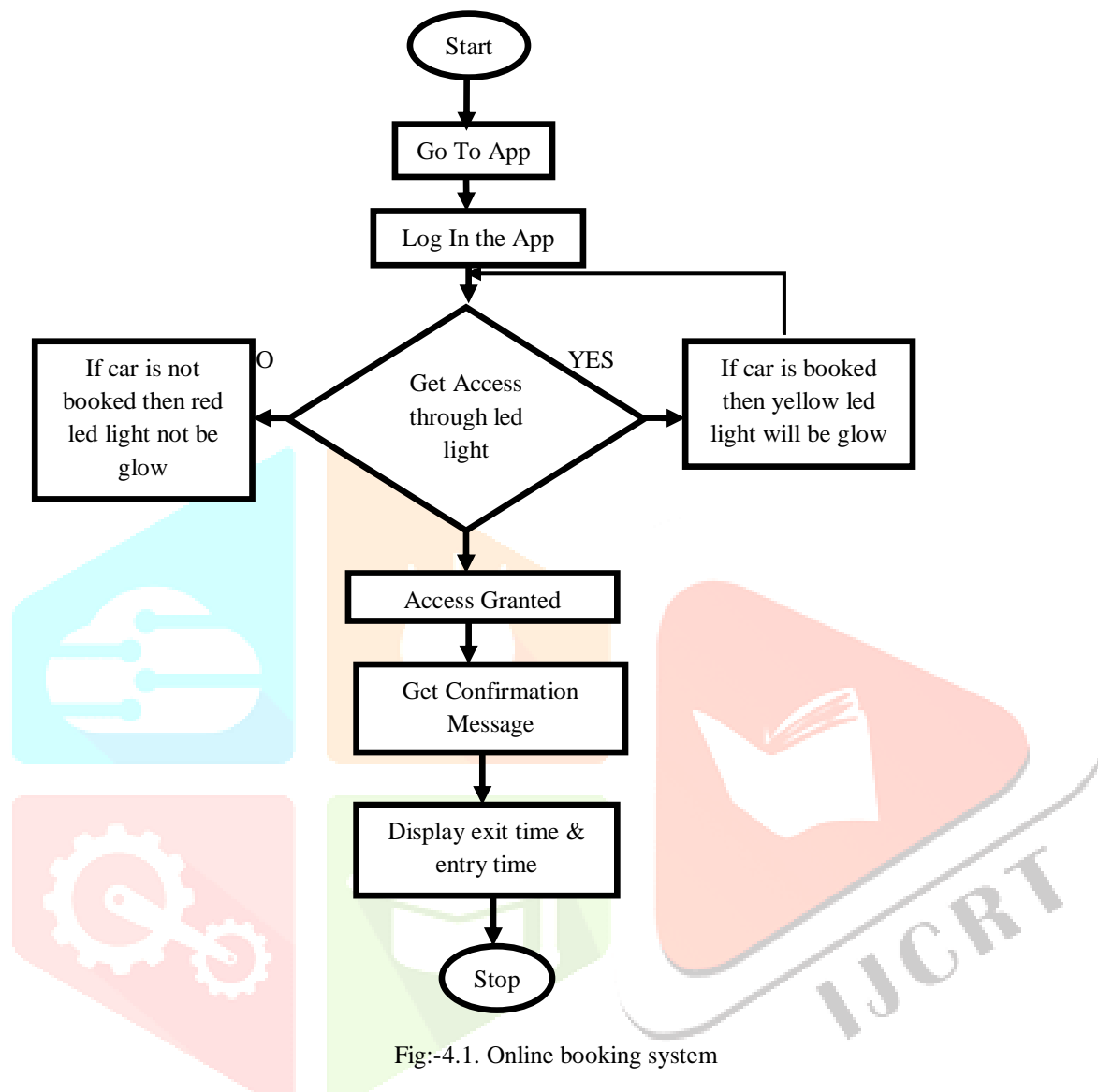

Fig:-4.1. Online booking system

4.2 STEPS OF HARDWARE DESIGN PARKING SYSTEM

STEP 1. First of all we install the app then connect the arduino through the blynk application.

STEP 2. After connecting the arduino through the blynk application IR sensor and servomotor are also connected.

STEP 3. Again connecting sensor, led, jumper wire and servomotor and it gives the information of car parking occupied and unoccupied parking slot in parking area.

STEP 4. After connecting all the components with arduino and jumper wires gives the details of car arrives and departure time.

STEP 5. If car arrives in slot 2 then it gives information of parking space is full and yellow light will be glow and if car departure in slot 1 then it gives information of parking space is empty and red led will be glow.

STEP 6. Thus, it gives the information of the car user's exit and entry time and car information full and empty slot should be displayed on the LCD display.

STEP 7. At the last all of them connected with the server and arduino cable should be connected with power supply and also after that all the working process of the components it should be controlled through the blynk application and in this way our hardware has been designed.
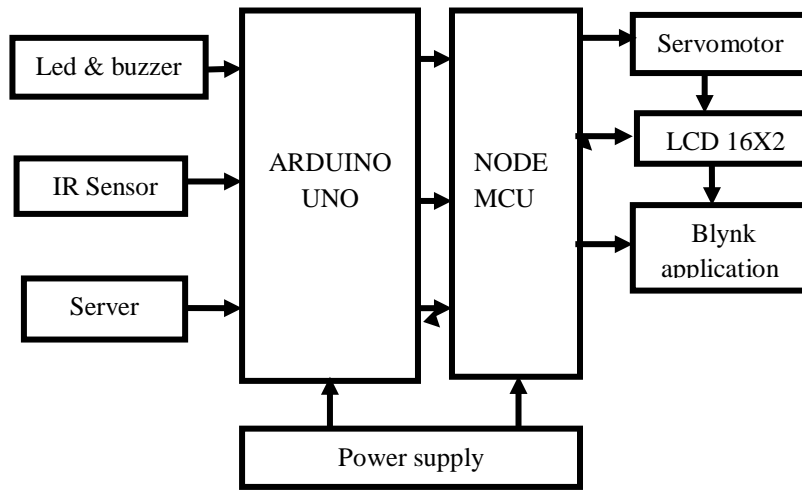
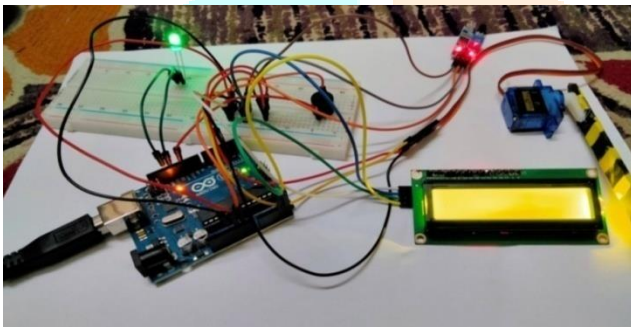Fig:-4.2 Hardware Connection of Sensor and Blynk App

V.RESULT

Fig:-5.1.Images showing parking slot 1 full & parking slot 2 is empty
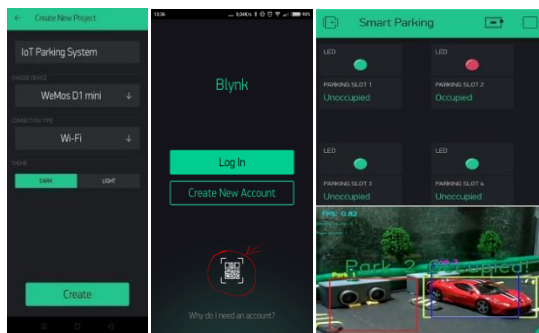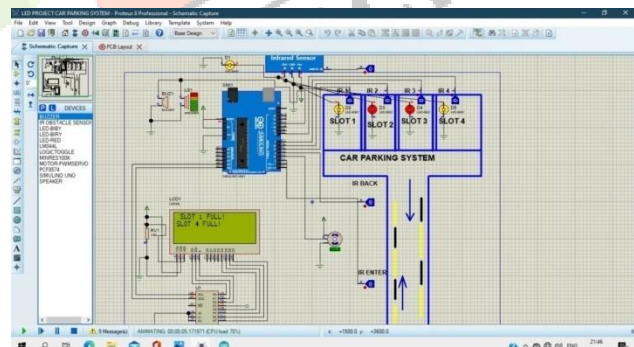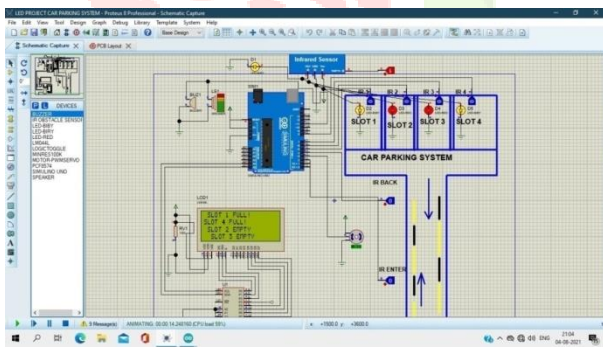

Fig:-5.2 Images of design of Car Parking System in Proteus & login details IOT parking with blynk application

VI.CONCLUSION

The proposed IoT based smart parking model comprises of remote sensor systems. This framework comprises of remote sensor systems, Blynk cloud and mobile application. The condition of the stopping opening is distinguished by sensor hub and that were accounted for intermittently to the blynk server through the remote sensor systems. This data is sent to blynk server through Wi-Fi organizes progressively. Here the user can discover empty parking spot by utilizing their portable application. This project helps us to build smart cities and helps to save time that were spend on searching the parking space and also saves the fuel consumption. It can be used to complete the idea of making smart cities. We also provided security features to the user for better development. Performance results show that our motivation has been achieved. It can also improve business objectives by providing parking spaces for local people.

REFERENCES

[1] Pranav Chippalkatti, Ganesh Kadam, and Vrushali Ichake "I-SPARK: IoT based Smart Parking System" in International Conference on Advances in Communication and Computing Technology (ICACCT), 2018, pp. 473-477

[2] Cristian Roman , Ruizhi Liao, and Peter Ball "Detecting On-Street Parking Spaces in Smart Cities: Performance Evaluation of Fixed and Mobile Sensing Systems" in IEEE Transactions on intelligent Transportation Systems,2018, vol. 19, pp. 2234-2245

[3]Mohammed Y Aalsalem, WazirZada Khan, Khalid Mohammed Dhabbah"An Automated Vehicle Parking Monitoring and Management System Using ANPR Cameras" July 1-3, 2015 ICACT2015, Faculty of Computer Science & Information System, Jazan University, Kingdom of Saudi Arabia 2015

[4]Rachapol Lookmuang, K. N. (2018).Smart Parking Using IoT Technology., IEEE, 6.

[5] Pampa Sadhukhan "An IoT-based E-Parking System for Smart Cities" in 2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2017, pp. 1062-1066

[6] Ming Wang, Huifang Dong, Xu Li, Liangliang Song, and Dandan Pang "A Novel Parking System Designed for Smart Cities" in Chinese Automation Congress, 2017, pp. 3429-3434.

[7] Anak Trivedi, Dr. Mandalapu Sarada Devi, and Dave Dhara "OpenCV and Matlab based Car Parking System Modulefor Smart City using Circle Hough Transform" in International Conference on Energy, Communication, Data Analytics and Soft Computing (lCECDS-2017), 2017, pp. 2461-2464.

[8] Ilhan Aydin, Mehmet Karakose, and Ebru Karakose "A Navigation and Reservation Based Smart Parking Platform Using Genetic Optimization for Smart Cities" in 5th International Istanbul Smart Grid and Cities Congress and Fair (ICSG), 2017, pp. 120-124

[9] D.Vakula and Yeshwanth Krishna Kolli "Low Cost Smart Parking System for Smart Cities" in International Conference on Intelligent Sustainable Systems (ICISS), 2017, pp. 280-284

[10]J. Zhang, Z. Wang, Z. Yang and Q. Zhang, "Proximity Based IoT Device Authentication", In IEEE Conference on Computer Communications, Atlanta, GA, 2017, pp. 1-9.

[10] Ming Wang, Huifang Dong, Xu Li, Liangliang Song, and Dandan Pang "A Novel Parking System Designed for Smart Cities" in Chinese Automation Congress, 2017, pp. 3429-3434.

[11] Ministry of statistics and programme implementation Government of India. Available:http://mospi.nic.in/statistical-year-bookindia/2017/189.

[12] Jin Xu, Guang Chen and Ming Xie, "Vision-Guided Automatic Parking for Smart Car" in IEEE Intelligent Vehicles Symposium Dearborn, USA., 2000, pp.725-730.

[13] Luca Mainetti, Luigi Patrono, Maria Laura Stefanizzi, and Roberto VergalloPablo "A Smart Parking System Based on IoT Protocols and Emerging Enabling Technologies" in IEEE 2nd World Forum on Internet of Things (WF - IoT), 2015, pp. 764-769.