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Smart Car Parking System by Using Iot

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Abstract-*In recent times the concept of smart citieshave gained grate popularity. Thanks to the evolution ofInternet of things the idea of smart city now seems to beachievable.Consistent efforts are being made in the fieldof IoT in order to maximize the productivity and reliabilityof urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safetyare being addressed by IoT. In this paper, we present an IoT based cloud integrated smart parking system The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. A mobile application is also provided that allows anend user to check the availability of parking space andbook a parking slot accordingly. The paper also The paper alsodescribesa high-level view of the system architecture. Towards theend, the paper discusses the working of the system in formof a use case that proves the correctness of the proposed model*

Keywords: *ESP8266 NodeMCU,IR Sensor,DHT11 Temp& Humidity Sensor,OLED Display,LED Panel*

I. Introduction

In the current scenario, due to increase in traffic, ample of drivers roam around in search of decent parking space. This not only creates traffic congestion but also time waste. What if a driver has advance information of available parking space in the required destination spot. So using IOT we can plan and provide the parking slot to the driver in advance. For malls and airport, parking spaces are so extremely large that it is impossible to manage it manually. In urban areas like Bangalore, Delhi, Chennai, car parking has become a critical subject with the steady increase in count of vehicles. Research survey shows 40% of vehicles including car and bike in this traffic congestion are mere searching for a decent parking area. Survey also adds that on an average seven and a half minutes' time is needed to find a space for parking. A research says that 75% of devices in INDIA shall be connected to the internet by end of the year 2018. In this parking system, we set out IR sensors such a way that when a car is parked in a particular slot, an IR sensor will sense the presence of a vehicle in that slot and update the database. The server maintained here is of shared type. The data will be processed before sending to the database. People can easily book in advance the parking slot and accordingly, the shared database will be updated. Future of IOT can be seen where human interference is minimal, technology will take the control of everything.

II. Related Work

1 Mr. Basavaraju S R-2015 has proposed An Carmatic Smart Parking System using Internet of Things (IOT)----Internet of Things (IOT) plays a vital role in connecting the surrounding environmental things to the network and made easy to access those un-internet things from any remote location. It's inevitable for the people to update with the growing technology. And generally people are facing problems on parking vehicles in parking slots in a city. In this study we design a Smart Parking System (SPS) which enables the user to find the nearest parking area and gives availability of parking slots in that respective parking area. And it mainly focus on reducing the time in finding theparking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area. Thus it reduces the fuel consumption

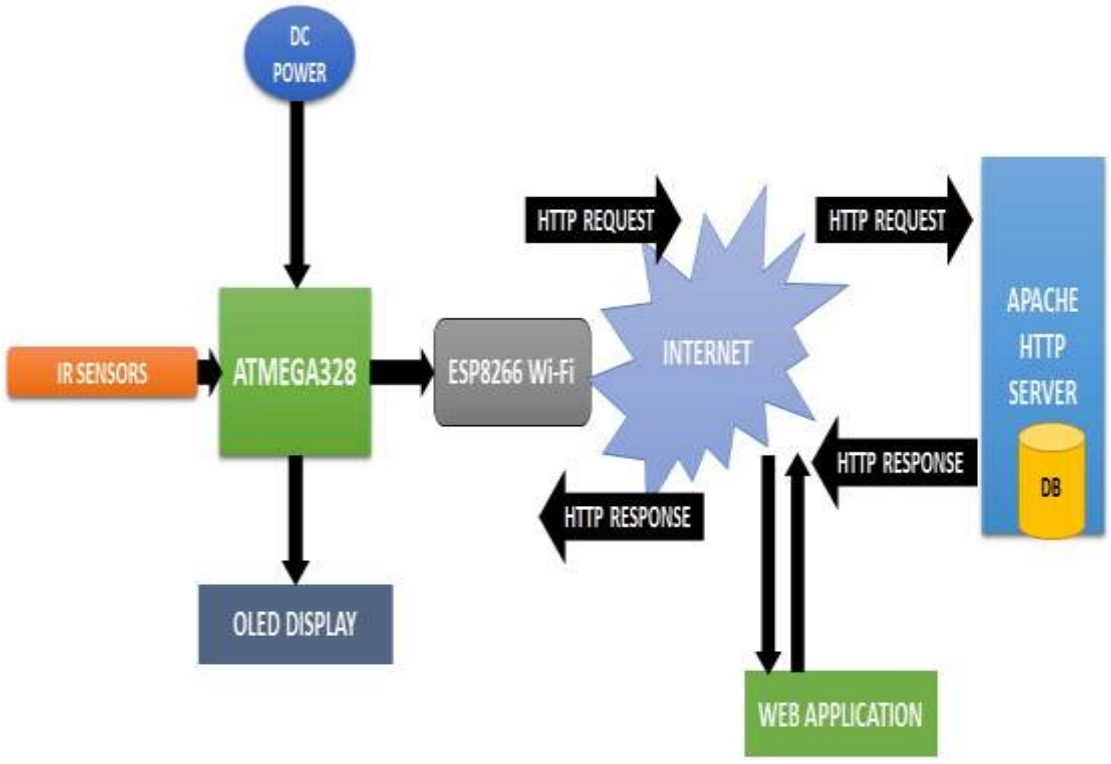
which in turn reduces carbon footprints in an atmosphere. Our system is a Raspberry pi based parking sensor which contains pi-camera to detect the empty parking spaces and sends this data to server, this stored data is accessed by users. International Journal of Computer Applications (0975 – 8887) Volume 169 – No.1,

July 2017 14 This enhances the user to check the status/availability of parking spaces before setting their journey Here the challenge is to use the existing resources in optimum level to reduce the searching time, traffic congestion in the city. Some embedded systems such as auridino, raspberry pi, Tsgate, Tsmote etc. are used to develop internet of things applications.A few existing parking system which uses sensors to collect the information but using sensors like video sensors in a parking system are expensive so our aim is to develop a system with less cost with more performance.

III. Proposed Methodology

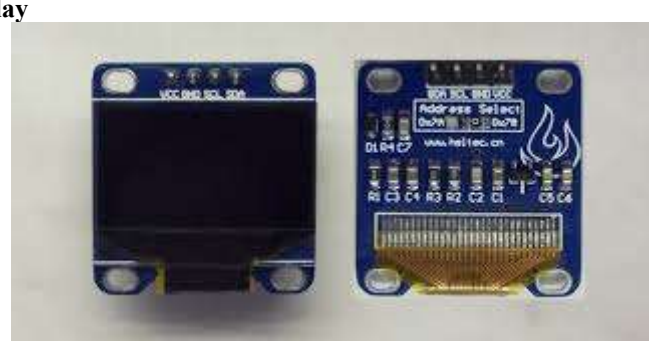
Shrewd Car Parking System Using Arduino UNO Designing, creating and delivering a main edge stopping innovation is called as Smart stopping. It is a vehicle stopping framework that helps drivers locate an empty spot. Utilizing the Ultrasonic sensors in each stopping space, it identifies the nearness or nonattendance of a vehicle. Brilliant Parking framework is demonstrated as a correct, strong and cost effective approach to guarantee that street clients know precisely where empty car parking spots are. Figure 1: Proposed Architecture As the populace expanded in the metropolitan urban areas, the utilization of the vehicles has also expanded. It causes issue for stopping which prompts movement clog, driver disappointment, and air contamination. When we visit the different open spots like shopping centres, multiplex film lobby and lodgings amid the celebration time or ends of the week it makes all the more stopping issue. In the current research found that a driver takes almost 8 minutes to stop his vehicle since he invest more energy in looking the parking area. This seeking prompts 30 to 40% of activity blockage. This project perceives how to diminish the stopping issue and to do secured stopping utilizing the shrewd stopping under Slot Allocation strategy with the assistance of Arduino UNO. The primary commitment of our proposed frameworks is to discover status of the stopping territory and give secured stopping. In the course of recent years, movement experts in numerous urban areas have built up a model called Parking Guidance and Information (PGI) framework for good stopping administration. PGI frameworks, tells about the dynamic data of stopping in the controlled region and aides the clients to the empty stopping spaces.

Proposed System
A.Block Diagram
Overall Architecture



Description

128x64 0.96" Oled Display



These displays are small, only about 1" diagonal, but very readable due to the high contrast of an OLED display. This display is made of 128x64 individual white OLED pixels, each one is turned on or off by the controller chip. Because the display makes its own light, no backlight is required. This reduces the power required to run the OLED and is why the display has such high contrast; we really like this miniature display for its crispness! This breakout can be used with either an SPI or I2C interface - selectable by soldering two jumpers on the back. The design is completely 5V-ready, with an onboard regulator and built in boost converter. It's easier than ever to connect directly to your 3V or 5V microcontroller without needing any kind of level shifter!

FEATURES

- Type: graphic
- Display format: 128 x 64 dots
- Built-in controller: SSD1306BZ
- Duty cycle: 1/64
- +3 V power supply
- Interface: 6800, 8080, serial, and I2C

Arduino - Uno

- **Ardunio Uno** is a microcontroller board developed by Arduino.cc which is an open-source electronics platform mainly based on AVR microcontroller Atmega328.
- First Arduino project was started in Interaction Design Institute Ivrea in 2003 by David Cuartielles and Massimo Banzi with the intention of providing a cheap and flexible way to students and professional for controlling a number of devices in the real world.
- The current version of Arduino Uno comes with USB interface, 6 analog input pins, 14 I/O digital ports that are used to connect with external electronic circuits. Out of 14 I/O ports, 6 pins can be used for PWM output.
- It allows the designers to control and sense the external electronic devices in the real world.

- This board comes with all the features required to run the controller and can be directly connected to the computer through USB cable that is used to transfer the code to the controller using IDE (Integrated Development Environment) software, mainly developed to program Arduino. IDE is equally compatible

with Windows, MAC or Linux Systems, however, Windows is preferable to use. Programming languages like C and C++ are used in IDE.

- Apart from USB, battery or AC to DC adopter can also be used to power the board.
- Arduino Uno boards are quite similar to other boards in Arduino family in terms of use and functionality, however, Uno boards don't come with FTDI USB to Serial driver chip.
- There are many versions of Uno boards available, however, Arduino Nano V3 and Arduino Uno are the most official versions that come with Atmega328 8-bit AVR Atmel microcontroller where RAM memory is 32KB.
- When nature and functionality of the task go complex, Mirco SD card can be added in the boards to make them store more information.

Flow Chart

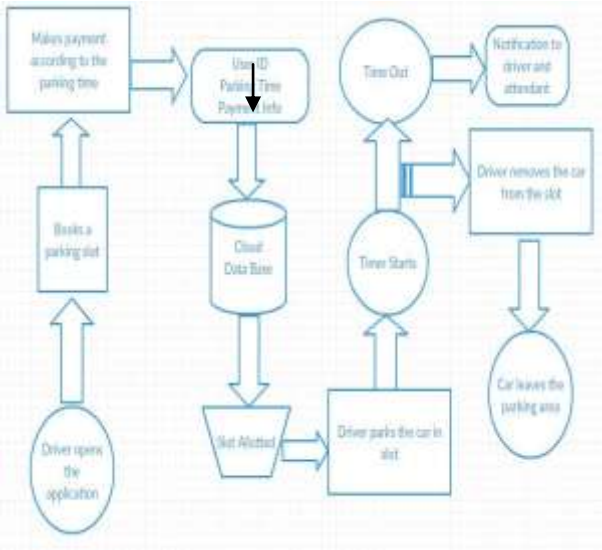


Figure 2: Flow chart of the system

We conducted an experiment in order to depict the working of our system at every stage from checking the availability of parking space to actually park a car in a vacant parking slot. This is done by implementing the smart parking system in the parking area of a shopping mall. Below are the steps that a driver needs to follow in order to park its car using our parking system.

- **Step 1**: Insall the smart parking application on your mobile device.
- **Step 2**: With the help of the mobile app search for a parking area on and around your destination.
- **Step 3**: Select a particular parking area.
- **Step 4**: Browse through the various parking slots available in that parking area.**Step 5**: Select a particular parking slot.**Step 6**: Select the amount of time (in hours) for which you would like to park your car for.
- **Step 7**: Pay the parking charges either with your e- wallet or your credit card.
- **Step 8**: Once you have successfully parked your car in the selected parking slot, confirm your occupancy using the mobile application.

The above mentioned procedure for booking a slot and parking a car in that very slot is explained with the help of the following screenshots.

Figure 3: Booking a parking slot

The above figure depicts the presence of vacant and occupied parking slots. In this case parking slots named A1 and A3 are vacant whereas slot A2 is occupies. The driver chooses the A1 parking slot

Figure 4: Selecting the amount of time

The above figure depicts the scenario when a driver needs to specify the amount of time for which it needs the selected parking slot. In this case the driver selects the 1 hour option.

Figure 5: Occupancy check

IV. Conclusion

The proposed system improves the performance by decreasing the empty space in a parking, and missing numbers of drivers who fail to find a parking space, reducing the cost of fuel to find a parking space, reducing air pollution when the user tries to find parking lots, adapted in environmentally friendly cities, our system can be in public and private sectors. The update of the state or website can be sent as the message for users which can make the driver more satisfied, put less effort on the user, the system benefits both the users and the owner of the park to go. The system minimized the waiting time of the user to find park lot. Managing smart parking becomes a strategically issue to process, for economic interest beside the research interest.

V. Future Enhancement

In future works, this framework can be enhanced by including different applications, For Example, internet booking by utilizing GSM. The driver or client can book their parking area at home or while in transit to the shopping center. This can diminish the season of the client to seeking the empty parking area. As a further review, distinctive sensor frameworks can be added to enhance this framework to distinguish the question and guide the driver or clients speediest. We will attempt to decrease the mechanical structure and attempt to make it ecofriendlyIn future, we will study include an additional component and field as the User Identification, National Number, and solving urgent cases by applying an urgent table. In order to make a database for everyone's entering and leaving the parking lot, an important step that serves security in general for Iraq and especially for Ministry of Interior and National Security is needed to stop car bomb in Iraq. There will be a general idea of the numbers of cars entering and leaving the parking lots and a plan to expand the parking in particular in every state and region and for the development of the city and its services can be generated

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