IOT Based Car Parking System

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Abstract

In recent times the concepts of smart cities have gained grate popularity. Thanks to the evolution of Internet of things the idea of smart city now seems to be achievable. Consistent efforts are being made in the field of IoT in order to maximize the productivity and reliability of urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. In this paper, we present an IoT based cloud integrated smart parking system. To demonstrate the concept, we use IR sensor for sensing the parking slot occupancy along with a servo motor to simulate as gate openers. The system detects if the parking slot are occupied using IR sensor. Also if a vehicle has arrived at the gate, the gate opens automatically if there is space available. The systems reads the number of parking slots available and update data and also checks if there is space available. It also uses a Led interface to display how many slot are empty and how many are full.Thus, the system solves the parking issues for cities and get users an efficient IOT based parking management system.

Keywords:Smart Parking, Wireless Sensor Network (WSN), Reservation, Resource Allocation, parking guidance and information (PGI)

Chapter 1: Introduction

Finding a vacant parking space is a common problem in most urban cities which especially occurs in popular and well travelled places like shopping complexes, stadiums and other well travelled areas or tourist attraction spots. This situation has become more serious especially during their peak time, be it holiday seasons, sales carnivals or any other festivals. This problem arises as most of the time, as patrons come by their own transport, resulting in abundance or high number or transports competing for a few vacant parking spaces. The limited availability of vacant parking spaces often results in traffic congestion, as well as making a driver frustrated in finding an available parking space. In fact, it is one of the main problems which result to traffic congestion.

Chapter 2: Literature Survey

Problem Statement-

In recent research in metropolitan cities the parking management problem can be viewed from severalangles. High vehicledensity on roads. This results in annoying issue for the drivers to park their vehicles as it isverydifficult to find a parking slot. The drivers usually

waste time and effort in finding parking space and end upparkingtheirvehicles finding a space on streets. In worst case, people fail to find any parking spaceespecially

during peak hours and festive seasons.

Objective-

Aim of car parking system are as follows:-

• Optimized parking– Users find the best spot available, saving time, resources and effort. The parking lot fills up efficiently and space can be utilized properly by commercial and corporate entities.

• Reduced traffic– Traffic flow increases as fewer cars are required to drive around in search of an open parking space

• Reduced pollution– Searching for parking burns around one million barrels of oil a day. An optimal parking solution will significantly decrease driving time, thus lowering the amount of daily vehicle emissions and ultimately reducing the global environmental footprint.

• Increased Safety– Parking lot employees and security guards contain real-time lot data that can help prevent parking violations and suspicious activity. License plate recognition cameras can gather pertinent footage. Also, decreased spot-searching traffic on the streets can reduce accidents caused by the distraction of searching for parking

Chapter 3: Proposed System

3.1: Algorithm
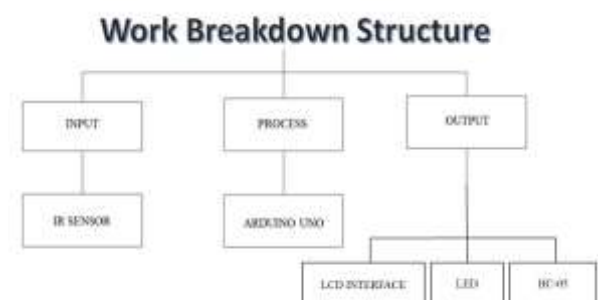
Step 1:- User checks for space via App or LCD.

Step 2:- Entry of a Vehicle.

Step 3:- If Slots are available.

Step 4:- Park the Vehicle at an Empty slot.

Step 5:- No. of Vehicle parked is incremented by 1.

No. of Vehicle parked slot is decremented by 1.

Step 6:- Update the information in Arduino Uno and Lcd interface.

Step 7:- Repeat Step 1-7 until System Failure.

Details of Hardware & Software

Software Requirements-

• Arduino IDE

• StarUML

• Blynk App

Hardware Requirements-
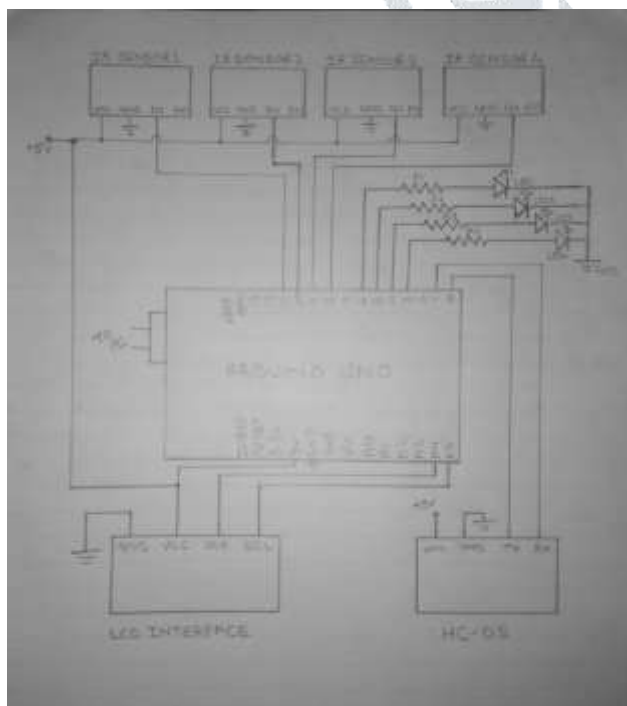
Arduino Uno

IR sensor

Led

Usb

Servo motor

LCD

I2C Module

HC-05

Resistor

Design details

Circuit diagram for Smart Car Parking System

Chapter 4: Implementation Plan & Proposed Cost of Project

Implementation Plan

• A planned approach for a successful project is of utmost importance as the saying goes like • "Plans are of little importance, but planning is essential."

• The planning approach used in this project is AGILE METHODOLOGY

AGILE METHODOLOGY

• Agile is a methodology of early delivering business value with less bureaucracy.

• It is a collection of software development methodology which works on an iterative and incremental method building the software from the very initiation of the project development instead of building all the software at once, same can be applied to develop the hardware machinery.

• Agile discovers what the customer and how to build the code and change things along the way.

• Agile works by breaking down the project into smaller chunks and then continuously delivering them in short two weeks cycles called iterations.

• In an agile development process, solutions are obtained by self-organizing teams which collaborate, discuss, and constantly strive to improve their working process and become more effective in what they do

Conclusion :

Significance Of The System -
• It is easier to understand.

• It performs the same task all the time so there is no need of any hardware changing such as extra memory or space for storage.

• It performs only one task at one time mean it purposed the dedicated task.

• Hardware cost of embedded c systems are usually so much low.

• Embedded applications are very suitable for industrial purposes.
Limitations-
a) It will not alow extra vehicle to the parking lot beyond the limit.

b) Can't show details of the parked vehicle(i.e parking duration,etc).

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