International Journal of Contemporary Research in Computer Science and Technology (IJCRCST) ISSN: 2395-5325
Volume 3, Special Issue 2 (March '2017)
Proceeding of - National Conference on Recent Trends in Information Technology and Communication,
Conference held at Velammal Engineering College,Chennai,India.

ADVANCED PARKING SYSTEM USING INTERNET OF THINGS

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Abstract: Technological development in the automobile industry has led to the mass production of cars of all makes and models. More and more people are buying these vehicles and as they use them to their fullest satisfaction the roads have become extremely crowded. Finding a place to park the vehicle is a mammoth task. The proposed work demonstrates an advanced parking system for detecting and finding the parking slot for the vehicles by the user using infrared sensor. The system detects vehicles in the parking fields, accurately. The available slots are updated in the website through Internet of Things (IoT).

I.INTRODUCTION

In Today's world ,IoT is used in variousapplication fields based on the needs of Users [1], [2]. Connectingbetween users and remote devices using IoT is based on the sensors and the middleware. It provides the user with the updatedinformation about various activities usedin our society. The advanced parking system is one of the major applications using IoT[3]. In our daily parking management systems, only the person who administrates has information about the parking slotsoccupied by the vehicles. The existing works do not support active information exchange is not able to provide accurate information the availability of free parking slots. To overcome this issue the proposed work uses sensors and middleware that are IoT based. An alarming situation of the present urban life is traffic congestion.This problem is growing exponentially in a global scale. Parking slot availability issue is a major contributor and is still a major problem with increasing vehicle number in the luxurious segment and confined parking spaces in urban cities. Searching for a parking space is a routine and often frustratingactivity.

This search burns about millions of barrel of the world's oil every day. As the global population continues to urbanize, without a well-planned, convenience-driven retreat from the car these problems will worsen. To make convenient parking method an IoT based system is proposed in this work. In the proposed work, an advanced parking system tosolve the problem of the exiting parking systems based on IoT modem and Bluetooth of smartphone. The IoT is continually monitoring the status of the car parking. This System provides the user with the necessary updates about the available slots in the parking area .The user can also preregister the available parking slot from a remote area. The proposed system is convenient for the users and also cost effective with no manpower intervention as it is autonomous.

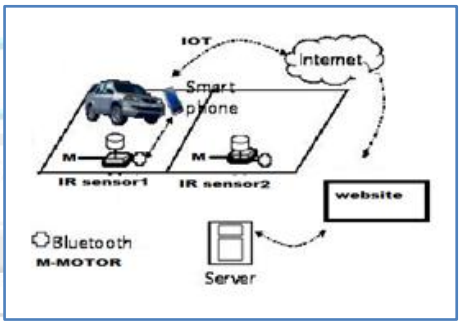

Fig 1.Advanced Parking System

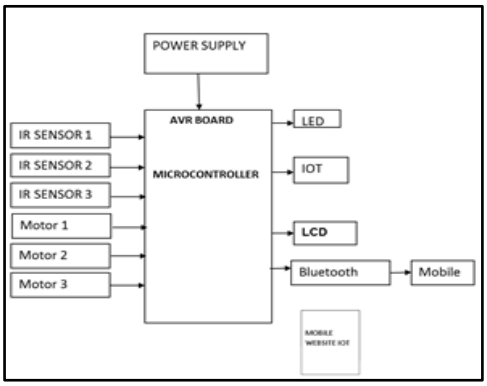

Fig 2. Block Diagram of System Architecture

II.SYSTEM ARCHITECTURE

For the parking system, the ATmega8 Microcontroller with an Infrared sensor and Bluetooth communication module is installed in each parking slot along with a gate for each slot. The Microcontroller collects the data from IR sensor and

communicates with the Web domain and updates the number of slots free in the parking area. The server provides the Web service based on the received data. To get the parking service, the consumers exploit the Web browser. The User can register the empty slot and park their vehicle within the time period using the unique code sent for their registration. Using Bluetooth the user can open their respective slot in the parking area.

Fig 3.Working Demo of the System

Hardware and Software Components

The hardware of Advanced parking system is composed of the Microcontroller, Bluetooth, IOT Modem,server Motor, LCD and IR sensor.Microcontroller comprises of AVR Board and ATmega8 mc. The software used for the work areAVR studio, Extreme Burner, Embedded C, PHP and MySQL.

II.PROPOSED METHODOLOGY

AVR studio uses embedded C to code the program. The code is dumped in the Microcontroller using Extreme Burner. PHP is used to create the frontend of the website for the system. Data sent and received in the website are stored in a Database using Mysql. Bluetooth terminal application in the mobile is used to access the gate in the slot. The Microcontroller using IR sensor is deployed on the parking lot, which are monitoring the vehicle existence on each parking slot and are sharing with the Web domain. The IoT modem is in charge for the data transmission to server. The status of the available parking slot is updated periodically. The user can register their slot remotely and park their vehicle in the allotted space.

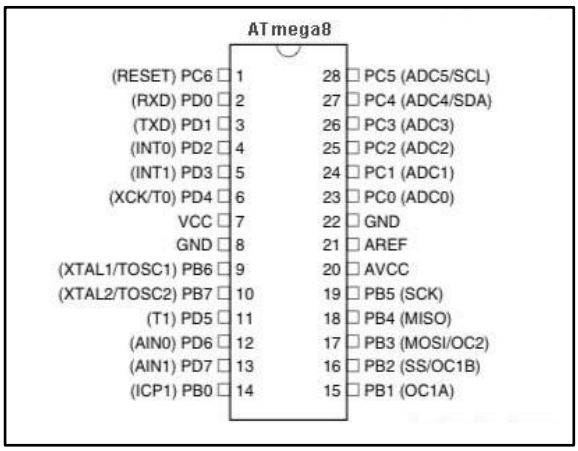

Fig 4. Pin Diagram of ATmega8

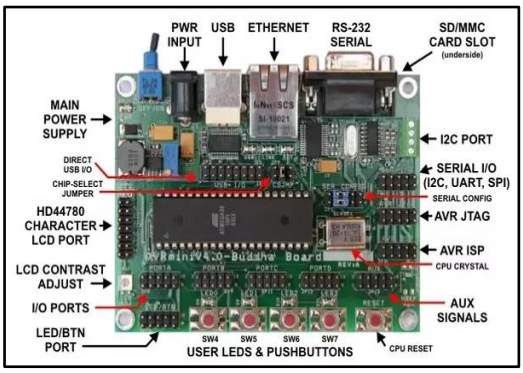

Fig 5. AVR Board

IV.RESULT ANALYSIS

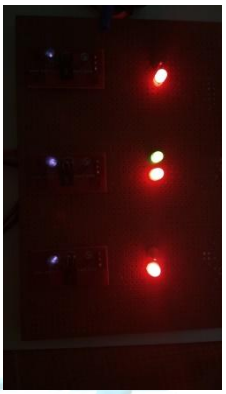

Fig 6.IR Sensors

In order to update the parking slot status to the users, the current status of each slot in parking space are identified using IR sensor and updated in the website.

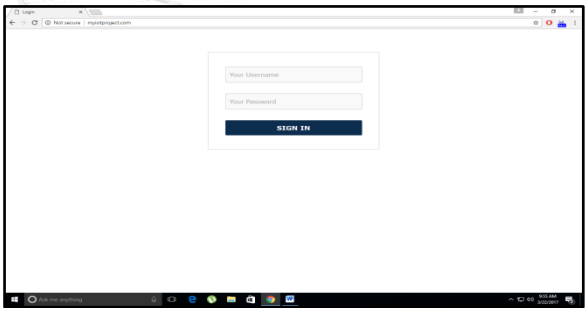

Fig 7 Login page

The user logs in the website using his/her User Id and password.

Fig 8.LCD Display

The user now selects the empty slot and registers the slot in his name.

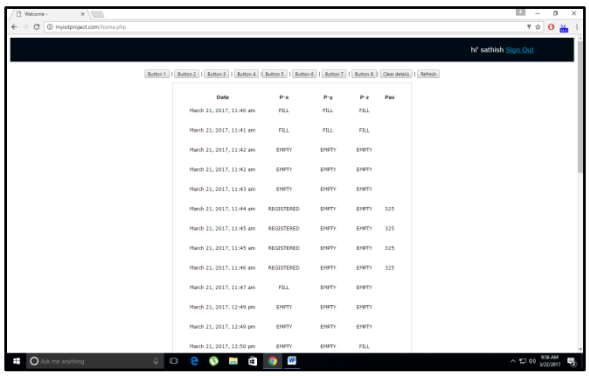

Fig 9.Main Page of website

The user receives a unique code. As the user reaches the parking space, the user enters his unique code in the provided Bluetooth cmd. The gate of the allotted slot opens for the user and thus the vehicle is parked within the provided time. Now the Website is updated with slot filled.

V.CONCLUSION

The Advanced Parking System using Internet of Things is implemented successfully. This method solves traffic congestion caused due to unsuccessful search for parking and reduces fuel conception thereby making it a cost effective solution.

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