Sri Lanka Institute of Advanced Technological Education

(SLIATE)

Project Proposal

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Title

Smart Parking System

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Contents

1. Introduction

Finding a free parking lot in a congested city like Batticaloa is very hard. Here, if anyone wants to go outside from home with personal car first thing comes in his mind is about parking, where he will park his car. Most of the cases, people go to a parking station and find that all parking slot are full and then he has to search for another parking lot. So, it is a big hassle and many people keep in fear about parking of his car when he gets out with his car.

The traditional parking systems such as multilevel or multi-store car parking systems (non-automated), robot car parking systems, automated multilevel car parking systems etc. have been implemented on a huge scale. But these systems have a major disadvantage of large space consumption which is successfully eliminated with the use of "Automatic car parking system". In an automated car parking, the cars are left at the entrance and are further transported inside the building with mechanical structure. Similarly, they are retrieved by mechanical structure and placed at the exit for the owner to drive away. Our proposed system presents an Autonomous car parking that regulates the number of cars that can be parked in a given space at any given time based on the parking space availability.

Parking is an act of bringing to a halt and (or) leaving a vehicle unoccupied. A parking lot, human interference. The results are communicated wirelessly to car owners when queried, notifying car owners of the condition of the parking space. This system differs from early parking system which utilizes human placed strategically at the parking lots to assist drivers in parking their vehicles. Application of Sensor technology to parking system allows for measurement of conditions of interest such as magnetic (metal) fluctuations and light radiation (radiation or reflection of light from objects).

So, I was thinking, how the problem can be solved and finally I succeeded to make a cloud based smart parking system and I hope implementing the system can remove the parking problem of my city. ARTIK Cloud is really a nice and appropriate platform for such job.

Using this system, a user will be will able to find an available parking lot easily using mobile or web app from anywhere. The system updates parking data every 30 seconds.

2. Background and Motivation

Public and private agencies need to become aware of performance, reliability, operation and maintenance cost considerations and patron acceptance. The subject of smart parking has not been widely recognized in this country for many years, even within parking and development industries. But the new systems are technologically and operationally far superior to the units built in previous decades. Owners, builders, agencies and patrons can be assured of cost-effective, reliable, safe and efficient services at competitive rates. A significant response to the benefits of these new systems is already forming, and use will accelerate rapidly as national awareness of the compelling reasons for the use of smart parking systems gains momentum. We need to explore and expand the increased construction of smart parking facilities.

The advantages of this technology are just too significant to permit further delay in their development and construction. In the era of technology, it is seen that population has increased to an uncontrollable extent. To compensate the problem so many mega projects are working. These projects are not secure so, to benefit mankind it was thought to make some effective design to compensate parking hazards and multistory rotational parking resolved the issue. Current Multistory parking systems are based on linear mechanism and it is found that Rotational parking system a best alternate to ease the user and save the space.

A multi-level, smart car parking unit comprising: a storage structure having one or more tiers with one or more common entry and exit points; at least one permanently fixed input-cut output elevator; a plurality of addressed slots in a plurality of parking platforms; a plurality of platform carriers and a centrally operated system controller for smart parking of a car in an addressed vacant slot and retrieval of a car from a slot independently and without hindrance to any of the parked cars; two elevators with space between them for storage of platform carriers, a transfer module having an independent drive with reversible option moving on a permanently.

3. Problem in Brief

Today buying a car is no longer considered a luxury. Owning a vehicle is more of a necessity or comfort. As the money flow increases, more and more individuals are expanding their ownership of vehicles. While this is happening, the complexities and conflicts of parking swell. Cooperation and coordination are vital for smooth functioning of parking lot areas. Fully Automated Car Parking Systems are ideal to address parking problems. For those still stuck with manual car parking systems, there are some deep parking issues.

Here are 5 major challenges of manual car parking systems.

1. Manual checks: Parking managers perform manually intensive work of counting permit and non-permit cars. In such a case, a manual check of vehicle status and handwritten tickets are required. Such kind of manual procedure leads to 50% entry errors, thus resulting in huge losses to the bottom line.

2. Paper records: It is difficult to sieve through the large amounts of information. To accomplish this task, garage lot managers have to spend hours searching for files for the exact information. These kinds of paper records create a lot of problems.

3. High labor costs: Reading, writing and entering data is very labor-intensive and time consuming. Unnecessary capital expenditure is increased due to the money spent on labor that performs repetitive manual tasks.

4. Making customers wait: Out dated or manual car garage systems make customers wait in long queues when they need to enter and exit the garage lot. Due to this, precious time of the customers is wasted and overall sustainability gets shaken.

5. Unauthorized access: The garage manager in-charge handwritten paper tickets can be duplicated easily. No security alerts are raised to the authorized personnel if any unauthorized vehicle enters the parking lot.

4. Aims and objectives

4.1 Aims

The aim of this project is to atomize the car park for allowing the cars into the park. The car is park to automatically through lift and sensor. Some special parking area which are allow to specific person which have code of the parking slot. The main object of the present invention is to provide a unit in which cars are stored into and retrieved from addressed slots automatically I simple, practical, safe, speedy, reliable, user-friendly and cost-effective manner. It is another object of the present invention to deploy more number of relatively less expensive transfer modules for simultaneous operations on all parking floors for the optimum utilization of the highly expensive elevator and thereby ensure quick parking and retrieval. It is another object of the present invention to provide a unit for storage and handling of the over-dimensional platform carriers automatically in safe, efficient, reliable, fast and cost effective manner to answer the present demands of Tit-and-forget" trend. It is another object of the present invention to open more entry/exit points to allow simultaneous placement of cars for parking/delivery without waiting.

4.2 Objectives

- Optimized parking
- Reduced traffic
- Enhanced user experience
- Increased safety
- Real time data and trend insight
- Decreased management costs
- Reduced pollution

5. Proposed Solution

The proposed solution for the manual parking system is to develop a smart parking system. Before developing the proposed system there is need to identify,

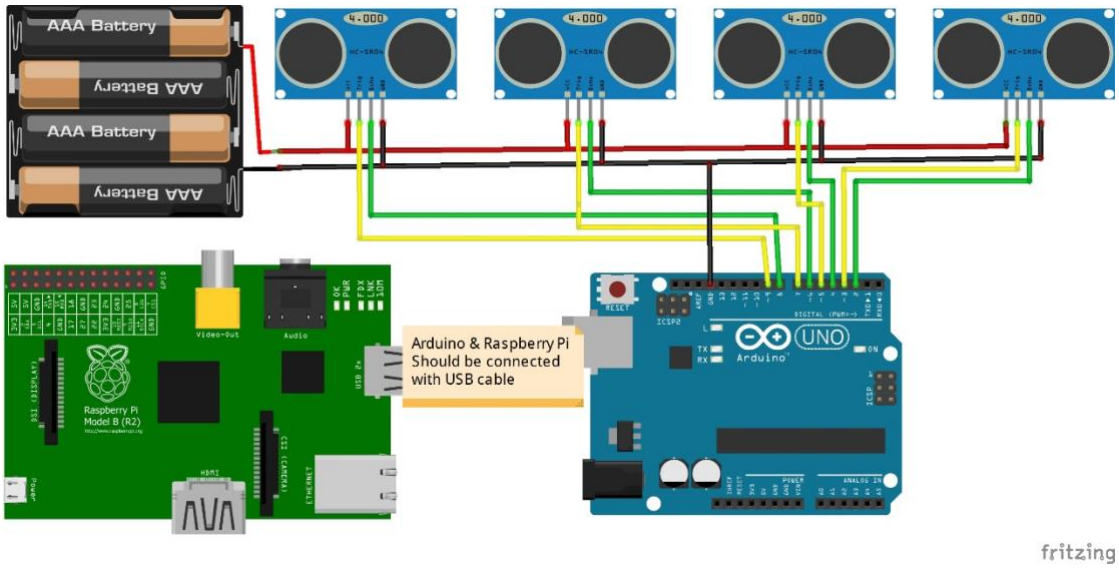
a) The design of the proposed system

b) The main users of the smart parking system

c) The activities of the main users.

5.1 The Design

Figure 1 Block diagram of a system



5.2 The main users

The main users of the proposed system are the Vehicle drivers

5.3 Their activities

They can check the available parking space in a parking Gurage and they can easily pal their vehicles

6. Resource Requirements

6.1 Hardware Requirements

- Raspberry Pi 3 Model B.
- Arduino Mega.
- Ultra-sonic sensors

6.2 Software Requirements

- Samsung ARTIK cloud for IoT
- Google maps
- IDE: Arduino

7. References

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