

Intelligent Car Parking System using Wireless Sensor Network

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Abstract— IoT is one of the technologies which can be used in every sector to make the things work smarter. This article tells about how the IoT technology is used in the car parking system to make the car parking system work automatically at the finger tips and how a security can be provided and the vehicle can be automated using the IoT techniques and make it more user friendly by providing a mobile application and operate via application, so that everyone can use that application and find the parking space easily and avoid wastage of time. This article also discusses about the challenges in the automatic car parking system.

Keywords: IoT, Smart Parking, Mobile Application, Automated Vehicle Parking

I. INTRODUCTION

Over years, India has developed in many ways. Now we are in the era where we have metropolitan cities, well-built roads, commercial buildings and the drastic increase in the vehicles. Providing the correct parking lots at the peak time plays a major role, so in this article we will discuss about the smart parking and how it can be automated using IoT Technology in the mobile application.

Smart Parking is the one of the solutions which provides the empty spaces for vehicles by identifying where the parking spaces is filled and were the space for parking is empty. The vehicles can be monitored using the GPS which comes along with the mobile application.

Smart Parking is provided for the vehicles by using the sensors are fixed in the parking spaces. If there are no vehicles in the parking lot it senses the information and sends it to the nearby receiver. The information obtained is used for broadcasting the parking information via mobile application. The devices also provide the live updates to the user always and the drivers can see where the parking is available through the mobile application.

The rest of the paper is organized as follows Section II discusses on the related articles on IoT techniques for automatic car parking system, Section III discusses about the existing methods, Section IV discusses about the challenges in the field of car parking system.

II. LITERATURE SURVEY

M.Swatha^[1] in their article discusses about the car assist technology which monitor the car driving path and view it in the mobile application via GPS services. It also discusses about the difficulties faced by user while car parking. P. Choorat^[2] in their article tells about how to detect the vacant parking space by using the license plate detection and integral projection for automatic. This article also discusses about how the car parking system is applied through retina method and edge processing histogram. Sanaa Alfatihi^[3] in their article discuss about the intelligent car parking system and how to detect the car damage during that process. It also tells about how the driver is alerted via sound and visual signal during the parking process. Mohamed Hana.fy^[4] in their

article discuss about how the vehicle can be tracked and generate a path for the car parking using the swam algorithm. Thanongsak Sirithinaphong^[5] in their article discusses how the automatic car parking system can be done using the number plate recognition. It also tell how the car number plate detection works such as first the image is taken as a input and later processed, later determines and classifies the number plate by the region extensions by using various detection and recognition techniques and display the result.

III. DIFFERENT TYPES OF EXISTING METHODS

From the era of travelling through bullock carts to travelling in cars we have come a long way ahead and the technology too. Some of the existing techniques used for parking the vehicles till now are:

A. Manual Parking

In manual parking technique, the user will purchase a space lot for parking so that he can park his vehicles whenever he want it that particular space itself. When the person goes out again he needs to find the parking space again, in this manual parking fails.

B. Perpendicular Parking

Perpendicular parking requires a greater care in turning. In this type of parking a vehicle is placed at the 90-degree angle and wheels placed straight in order to curb the space between the two cars. This perpendicular parking comes with risk factor.

C. Illegal Parking

Illegal Parking is parking the vehicles where they are not supposed to be parked. Illegal parking is done most of the time when the driver fails to find the space for his vehicle, which in turn causes the traffic jams.

D. Ticket Parking

In this if the parking space is available then the ticket will be issued to the user and the hour wise the amount is paid. This method fails when the parking space is not available, it leads to wastage of time.

IV. CHALLENGES IN AUTOMATIC CAR PARKING

Automatic car parking system exists in most of the developed countries. Automatic car parking system doesn't exist in the developing countries because of various factor such as cost, minimal energy consumption, availability of the dynamic spaces so that they guide the traffic by reaching their final destination. The other main challenge is ensuring the safety of the parked vehicles and ensuring there is no confusing parking policies and providing the perfect parking and ensuring the correct path is given for the vehicles to park. These are few challenges in automatic car parking system.

V. CONCLUSION

In this article, the various existing system which are used for controlling the devices which are present in home are discussed. It also discusses the IoT technology and how it can be used for home automation. The various ways how the home can be automated is discussed, by which using those techniques the home can be completely automated saving the electricity, avoiding the human interventions and provide the reliability to use those devices. This article also discusses on the challenges in the home automation techniques.

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