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Rear View Automatic Car Parking System

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Abstract

Parking is costly and limited in almost every major city in the world. A Rear view Automatic car parking systems for meeting near term parking demand are needed. There is need to develop a vacant parking slot detection and tracking system. Around view monitor (AVM) image sequence makes it possible with 360-degree scene Bird's eye view camera. Around view monitor (AVM) captures the image sequence and on combining of each images empty slot is detected. The Ultrasonic sensor is useful to determine the adjacent vehicle. Hierarchical tree structure based parking slot marking method is used to recognize the parking slot marking. After combining sequentially detected parking slot, empty parking slot is recognized and the driver has to select one of the empty parking slots and drive into it

Keywords: Automatic car parking, ATmega 8, LCD, AVM, Ultrasonic sensor, detection of empty slots

INTRODUCTION

Parking means to place a car from some initial position to some goal position or final position without any collision or disturbance. Manual parking has many difficulties associated with it. After get into parking first problem is to find a parking slot which is vacant and space is sufficient so car can be parked in. Controlling speed of vehicle and orientation angle of vehicle is also vital task. Because of large number of traffic accident and requirement of driver, this autonomous parking of car gets more attention. Many car manufacturing companies and research institute conduct research and develop car parking systemNow a day, There is a rapid growth in the parking system. So, The is need to research an automatic parking system which will be useful for the careful parking of car and other vehicle [9]. Various approaches which we were using in parking system: user interface-based approach, free space-based approach, parking slot marking-based approach, infrastructure based approach. The fusion of AVM system and an ultrasonic sensor is used to detect and track the vacant parking slot in the automatic parking system. The Around View Monitor (AVM) provides a virtually 3600 scene of the car in bird's-eye view. The Around View Monitor (AVM) is a support technology that assists drivers to park more easily by better understanding the vehicle's surroundings through a virtual bird's-eye view from above the vehicle. The Around View Monitor (AVM) helps the driver visually confirm the vehicle's position relative to the lines around parking spaces and adjacent objects, allowing the driver to maneuver into parking spots with more ease. [2]

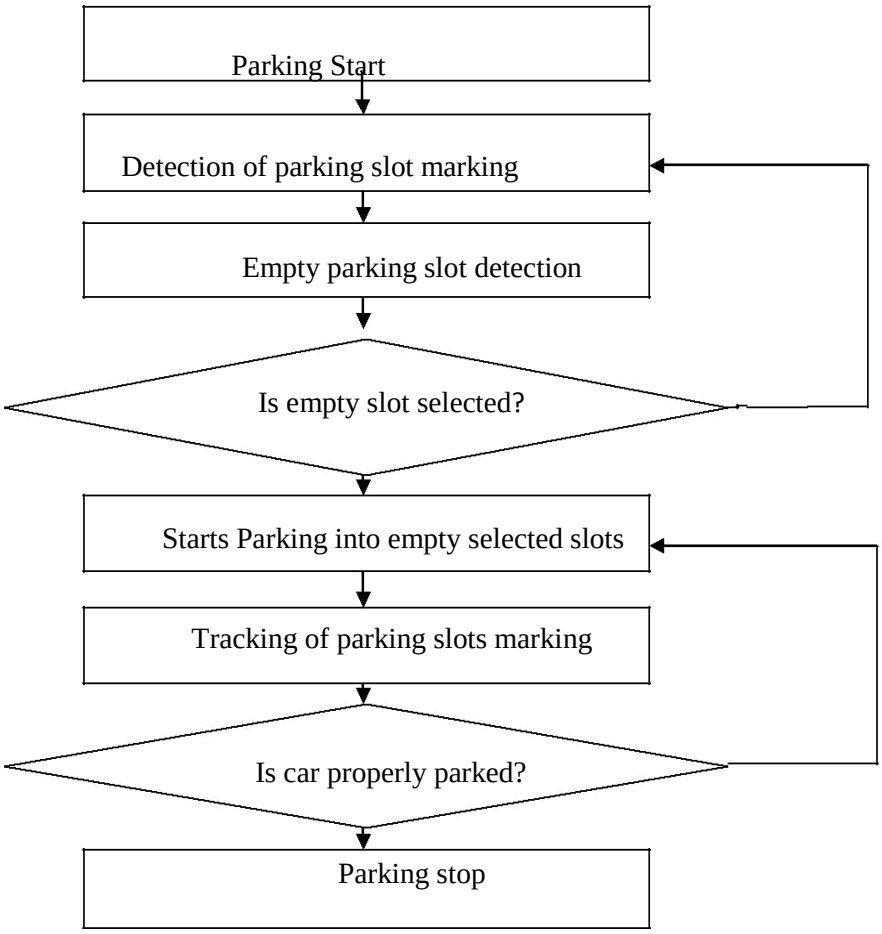

Fig-1: General flow chart of Parking System [1]

LITERATURE SURVEY

In the previous parking system driver manually selects the parking slot and drive into it. This method is useful as a backup tool for failure cases of automatic parking system methods. Manpower is needed for each car parking slot to select a parking slot manually and give direction to drive properly into the slot [1]. There is need of manpower, so this system is replaced by the ultrasonic sensor based system. In this system, two ultrasonic based sensors are mounted on both sides of the front bumper. Adjacent vehicles are detected by using ultrasonic sensor data.[8] These ultrasonic sensor find the adjacent vehicles and driver properly drive into the free space between that adjacent vehicle. Using the multiple echo function, parking space detected more accurately in real parking environment. These method fail when there is no adjacent vehicles and in slanted parking situations where adjacent vehicle surfaces are not perpendicular to the heading directions of ultrasonic sensors [1] [4]. Another method is Parking slot Marking-based method. In this method vehicle mounted cameras, are used. It simply tracks the parking

slot marking present on the road. The distance between point and line-segment is used to distinguish guideline from recognized marking line segments. Once the guideline is successfully recognized, T- shape template matching easily recognizes dividing marking line-segments. This method fails where parking slot marking are not present. This system consists of range data preprocessing, corner detection, and target parking position designation. The major disadvantage of this system is the expensive price of the sensor [7].

METHODOLOGY

The main concept behind the detection of free parking slot is to recognize the parking slot marking. The hierarchical tree structure based parking slot, marking method deals with the four most commonly appearing types of parking slot markings, i.e., rectangular, slanted rectangular, diamond, and open rectangular types. These four types of parking slot markings consist of four types of slots, i.e., TT-slot, TL-slot, YY-slot, and II-slot and each slot is composed of two junctions.[3] These junctions can be categorized as:

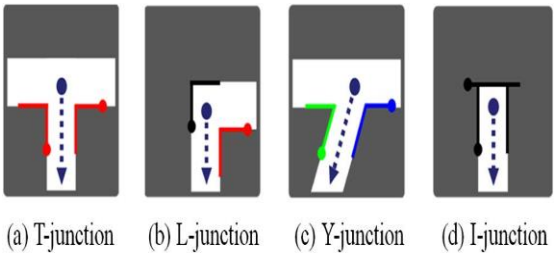

Fig-2: Parking Slots type [3] [5]

HARDWARE DESCRIPTION

a.) ATmega 8 Microcontroller:

In 1996, AVR Microcontroller was produced by the "Atmel Corporation". The Microcontroller includes the Harvard architecture that works rapidly with the RISC. The features of this Microcontroller include different features compared with other like sleep modes-6, inbuilt ADC (analog to digital converter), internal oscillator and serial data communication, performs the instructions in a single execution cycle. These Microcontrollers were very fast and they utilize low power to work in different power saving modes.[4] There are different configurations of AVR microcontrollers are available to perform various operations like 8-bit, 16-bit, and 32-bit.[1]

b.)Ultrasonic sensor:

The 40 kHz Ultrasonic Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back. The sensor has 2 openings on its front. One opening transmits ultrasonic waves, (like a tiny speaker), the other receives them, (like a tiny microphone) .The speed of sound is approximately 341 meters (1100 feet) per second in air. The ultrasonic sensor uses this information along with the time difference between sending and receiving the sound pulse to determine the distance to an object.[3][7]

c.)Regulator IC:

voltage regulator IC's are the IC's that are used to regulate voltage.IC 7805 is a 5V Voltage

Regulator that restricts the voltage output to 5V and draws 5V regulated power supply. It comes with provision to add heat sink. The maximum value for input to the voltage regulator is 35V. It can provide a constant steady voltage flow of 5V for higher voltage input till the threshold limit of 35V. If the voltage is near to 7.5V then it does not produce any heat and hence no need for heat sink. If the voltage input is more, then excess electricity is liberated as heat from 7805. [5][8].

d.)LCD display:

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. The data is the ASCII value of the character to be displayed on the LCD. [3]

e.) Battery:

Very Small in size and weight compared to Ni-Cd, Ni-MH and Lead Acid Batteries ,Discharge rate upto 4A , Full Charge in 3 to 4 hours ,Long life with full capacity for upto 1000 charge cycles ,2X Li-ion 4.2V 2000mAh cells (2S1P) , Low maintenance.[3]

SOFTWARE DESCRIPTION

The software used is AVR Studio from Atmel corporation .It includes the Programming of ATmega 8 Microcontroller Atmel Studio is the integrated development platform (IDP) for developing and debugging Atmel SMART ARM-based and Atmel AVR microcontroller (MCU) applications. It supports all AVR and Atmel SMART MCUs. The Atmel Studio IDP gives you a seamless and easy-to-use environment to write build and debug your applications written in C/C++ or assembly code. It also connects seamlessly to Atmel debuggers and development kits. [7]

CONCLUSION

After reviewing these techniques for automatic parking system it is found that still there are some methods that are not studied. Technique we used is needs to be more accurate. New techniques can be developed in future that are far more accurate and reliable more than this all. One direction of research is the sensors that are available are not stable. They will not give reliable answer in all weather conditions. New automatic parking system should be developed that is able to park a car in all cases. Sometimes parking space is an issue in that. Research area for diagonal parking is a main area of interest. In today's world artificial intelligence attract more attention so it can be utilize a good tool to implements a efficient and accurate parking system. An automatic system that is design must be able to work in full uncertainty of environment. It also works in dynamic environment where parameters are changed with time.

FUTURE SCOPE

In our country, Ground Parking system is very popular. But it required much space whereas Automatic multistoried car parking system helps to minimize the parking area. In the modern

world where parking space has become a very big problem, it has become very important to avoid the wastage of space in modern big companies and apartments etc. in places where more than 100 cars need to be parked, this system proves to be useful in reducing wastage of space. This automatic car parking system enables the parking of vehicles, floor after floor and thus reducing the space used. Here any number of cars can be parked according to the requirement. These makes the system modernized and thus space-saving one.

REFERENCES

[1] Ankit Gupta, Rohan Divekar, Mohit Agrawal, "Autonomous Parallel Parking System for Ackerman steering four wheelers",IEEE 2010]

[2] Jhagadhambal K. ,Arunkumar B. "Autonomous Self Parking and Self Retrieving Vehicle With GPS Less Keyfobfor Vehicle Tracking", IJSETR Volume 2, Issue 4

[3] K.Demirli, M. Khoshnejad , "Autonomous parallel parking of a car-like mobile robot by a neuro-fuzz sensorbased controller", Fuzzy Sets and Systems 160 (2009) 2876–2891

[4]M.M.Joshi, M.A.Zaveri," Neuro-Fuzzy Based Autonomous Mobile Robot Navigation System".IEEE 2010, 11th Int. Conf. Control, Automation, Robotics and Vision

[5] Mohamed Hana.fy, Mostafa M Gomaa, Mohamed Taher, Ayman M Wahba, "Path Generation and Tracking for Car Automatic Parking Employing Swarm Algorithm", IEEE 2011

[6] Ms.Sayanti Banerjee, Ms. Pallavi Choudekar, Prof. M.K.Muju, "Real Time Car Parking System Using Image Processing," IEEE, 2011

[7] W.Wang, Y.Song, J.Zhang and H.Deng"automatic parking of vehicles: a review of literatures" IJAT Vol. 15 No. 6 pp.967-978(2014)

[8] Yanan Zhao, Emmual G. Collins Jr, "Robust automatic parallel parking in tight spaces via fuzzy logic", Robotics and Autonomous Systems 51 (2005) 111–127