Smart Car Parking System

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Abstract-India is one the Country with High dense population Take advantages of modern wireless connectivity, we designed and developed parking system based on image processing. The use of smart parking system has become very important especially for metropolitan areas, due to its benefits for the users regarding time, fuel consumption, and frustration when searching for a vacant parking space. In the Proposed process the Parking area can be marked with certain specific number and an sensor and with the help of these sensor the empty space can be identified to park the vehicle. In addition to display an audio system have been interfaced in order to provided information about parking .

Keywords-Intelligent Parking, Image Processing, Vehicle, Arduino uno

I. INTRODUCTION

In Olden days people use the public mode of transportation as Bus and Train for moving from one place to another. But due to Globalization the people move from rural area to urban areas for employment and other needs the Individual transportation have been improved a lot for their ease. Owing to these increase in vehicle the parking become very complicated and the people can park their on the either sides of the roads results in heavy traffic.

At Present most the people not aware of the empty space at the parking areas. In proposed idea the camera can be used to sense the empty space through video image detection. The image can be captured and they can be allowed to Image segmentation and edge detection through boundaries wit canny operator method. The moving car is to be parked at specific zone, at first the parking area has to be identified at the zone then the parking space has to be identified and check whether there is empty space is available or not. In The parking area the Image Processing Technique have been Implemented that will undergone the Image Segmentation and Edge Detection in addition to that a Counter is also Interfaced

The Present work attempts on Identifying the Parking lots by the respective number and the Sensor present at that lot. The Sensors are placed at the parking area if the signal from transmitter will not received by the sensor then the sensor is sensed and result shows that the Parking lot is filled, so the driver will prefer the rest of the parking lots.

II. SYSTEM MODULE

The Proposed module attempts on the Image Processing Technique through the MATLAB as a Software platform. The projected mechanism involves five step module to perform the operation. The processing steps can be shown in the block diagram as shown in Fig. 1. as follows.

Fig. 1 Block Diagram of System Module

In the System Initialization Process the manual drawing procedure will be put into practice. In the manual Drawing process the image can be drawn with Park slot number which will be helpful in identifying the Empty parking area. Once the System Initialization module gets completed it can be allowed to the next processing module called as the image acquisition module in the Image Processing Techniques.

III. PREVIOUS WORK

This research study is carried out to explore the approach user centrered design with a focus on stakeholders involvement in the development of a smart Parking technology prototype it a become usual for a driver to spend a large part of his time just minutes looking for place to stop his car and stand in unwanted Place which paying fee parking place which would be avoided by the student . time consumption and traffic is the Main and problem to parking system.

IV. PROPOSED METHODOLOGY

They can be used to Trace the outline of the Detected Image. The Digital camera will take the Images from various locations with some noise. The Obtained noise can be removed with the help of a technique called Morphology. The Morphology can be a special Technique which is used to neglect the Imperfection obtained during the Image Segmentation. The Morphological mechanism undergone the following process named as Dilation, Erosion, Opening and Closing Process and among those four process the Opening and Closing Morphological process are the most commonly used Process for the noise

removal. The Opening process is to remove the tiny objects present in the Segmented Image and the Closing process is to remove the unwanted and tiny holes present at the Segmentation process. The main role of the Morphological mechanism is to provide the exact Edge and shape of the image without any Distortion. In the proposed mechanism the exact boundary of the image has to be used to detect the empty parking space is to be traced. The rest of the process named Dilation and Erosion is used in this stage in order to increase or decrease the pixel range of the Output Image after enhancement. The Dilation is used to improve the Pixel range to the outline boundary of an image. The erosion is an another process which will removes the unwanted pixels on the boundaries. In the proposed process if the input pixel value of an binary image is equal to '0' then the output pixel is to be '0'. Using cctv camera send the video to the user to parking the car in the area an cam can be set to report changes to the scene as a grid on polygon taking into account different times of the day night season and the ever changing weather

At the same time the user can interact with the system through the app the user should be able to click on a button to confirm that arrive through applying human computer interaction principles parking system free space are occupied in to the area

Figure 2 . Image after Noise Reduction

V. RESULTS AND DISCUSSION

The parking of a vehicle through the image processing can be highly efficient and more accurate without any manual interruption. In the proposed architecture will shows a parking area with 8 slots of parking area. Based on the threshold value the Empty parking area can be displayed through an Camera preview display unit. The display can be indicated through the LED display. In addition to the LED display an Audio system have been Interfaced to the System design. Thus the Vehicle is sensed by the Sensor the availability of Parking area and appropriate Parking

slot can be informed to the driver through audio announcement. Thus the proposed architecture will be very helpful in park the vehicle in the parking area without any distortion and which results in the time and parking area consumption can be reduced.

VI. CONCLUSION

If the proposed architecture is Implemented in the day to day life the parking of vehicle can be made easier. The Process of identifying the parking area and the number of empty parking slots can be determined with the help of an Image processing technique. The parking slots can be easily identified and the shape of that particular slot can be determined which results in occurrence of parking the vehicle in safe area within short span of time without any delay. The Proposed design is implemented for a small area of 8 Parking slots in a particular region. But the proposed idea can be extended for all around the city by providing additional information through the GPS module which would be helpful to identify the parking area in a particular zone through GSM with an Mobile application and the status of that parking area that is the availability of the empty parking slot has also to be considered in future through the Mobile Application.

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