Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X

IJCSMC, Vol. 5, Issue. 2, February 2016, pg.230 – 234

SMART CAR PARKING USING ARDUNIO AND ANDROID APPLICATION

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Abstract—This paper proposes a technique for the awareness of free parking zone with Sensors. In order to resolve the issues that the drivers can't notice the best parking zone timely, a reservation primarily based best parking zone is intended. It detects parking slots by individual Sensors mounted to the slots. Parking slot occupancy is probabilistically calculated by treating every parking slot region as one cell of the occupancy grid. It facilitate drivers conveniently choose one among the available parking slots and support the parking system by continuously updating the selected target positions. supported the users familiarized parking info. This model uses a phased choice methodology to calculate the optimum objective car parking zone. the primary stage is sensing the parking slot using the sensors; the second stage is detected information is processed in Ardunio; the third stage is user can get the parking details in their smart phones through GPS to decide on their required slot. slots and support the parking control system by continuously updating the designated target positions. Based on the users oriented parking Information. This model uses a phased selection method to calculate the optimal objective parking lot. The first stage is sensing the parking slot using the sensors; the second stage is sensed data is processed in Ardunio; the third stage is user will get the parking details in their smart phones through GPS to choose their required slot.

Keywords— Global positioning System (GPS), Ardunio.

I. INTRODUCTION

The Internet of Things (IoT) advert to the interconnection of uniquely identifiable embedded computing-like devices within the Internet. Generally, IoT offers advanced connectivity of devices, systems, and services beyond machine-to-machine communications (M2M) and covers protocols, domains, and applications. The connection of these embedded devices (including smart objects), is expected to user in automation in all the fields, while also advanced applications like a Smart Grid. The IoT can be facilitated in integration of communications, control, and information processing across various transportation systems, i.e. the vehicle, the infrastructure, and the driver or user. The interaction between these components of a transport system enables inter and intra vehicular communication, smart traffic control, smart parking, electronic toll compilation systems, logistic and fleet management, vehicle control, and safety and road assistance. Due to the rapidly growing interest in parking aid products, automatic parking systems have been researched extensively. Target position designation is one of the primary components of automatic parking systems.

II. IOT FRAMEWORK

Internet of Things frameworks might help support the interaction between things and allow for more complex structures like Distributed computing and the development of Distributed applications. Currently, some Internet of Things frameworks seem to focus on real time data logging solutions like Jasper Technologies, Inc. and Xively: offering some basis to work with many "things" and have them interact. Future developments might lead to specific Software development environments shown in Figure: 1.1 to create the software to work with the hardware used in the Internet of Things. Companies are developing technology platforms to provide functionality for the Internet of Things. The XMPP standards foundation XSF is creating such a framework in an fully open standard that isn't tied to any company and not connected to any cloud services. This initiative is called or Chatty Things. XMPP provides a set of needed building blocks and a proven distributed solution that can scale with high security levels. Support is provided for design through deployment with an included IDE, Android client and runtime. Based on a component modeling approach MASH includes support for user defined things and is completely data-driven.

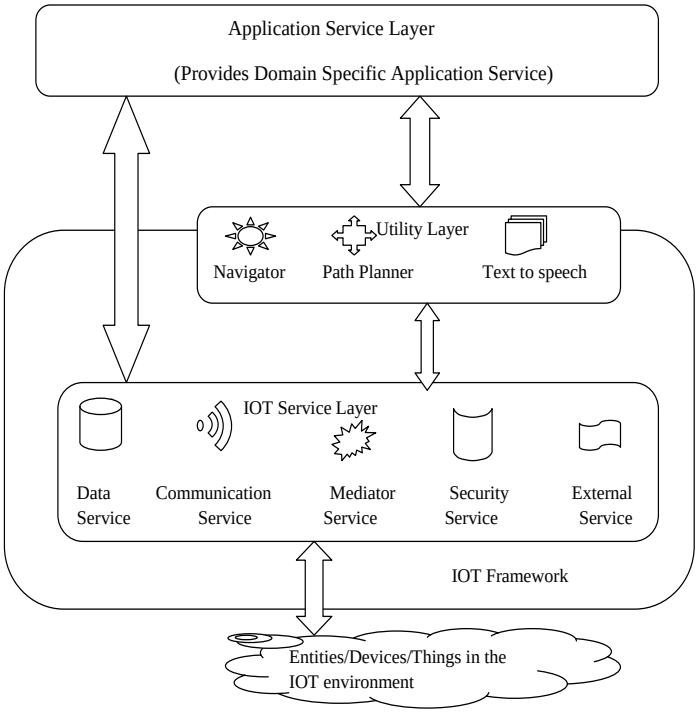


Fig 1: Framework of IOT

III. RELATED WORKS

C. Vestri, S. Bougnoux, R. Bendahan, K. Fintzel, S. Wybo, F. Abad and T. Kakinami [2] proposes that information about the location and availability of a parking space near the destination is provided to the drivers by the GPS-based vehicle navigation system. The information of the current state of the parking facility is provided. A parking lot cannot be guaranteed till the driver reaches the facility. A scientific solution based on usage of the past and current status of the parking lot is provided. Poisson process is used for modelling the vacancy of a parking lot. An intelligent algorithm helps the driver in choosing the slot with maximum probability of being vacant. Distinct methods and different cities were used for demonstrating the issues. It also highlights various challenges of on-street parking such as peer-to- peer exchange and also storage of parking information.

J. K. Suhr and H. G. Jung [4], proposes a method that recognizes various types of parking slot markings by modelling them as a hierarchical tree structure. This method consists of two processes: bottom-up and top-down. First, the bottom- up process rise up the hierarchical tree structure to excessively generate parking slot and so the candidates will not lose the correct slots. This process which includes corner detection, junction slot generation, and type selection procedures. After that, the top-down process approve the final parking slots by eliminating falsely generated slots, junctions, and corners based on the parking slot property marking type by climbing down the hierarchical tree structure.

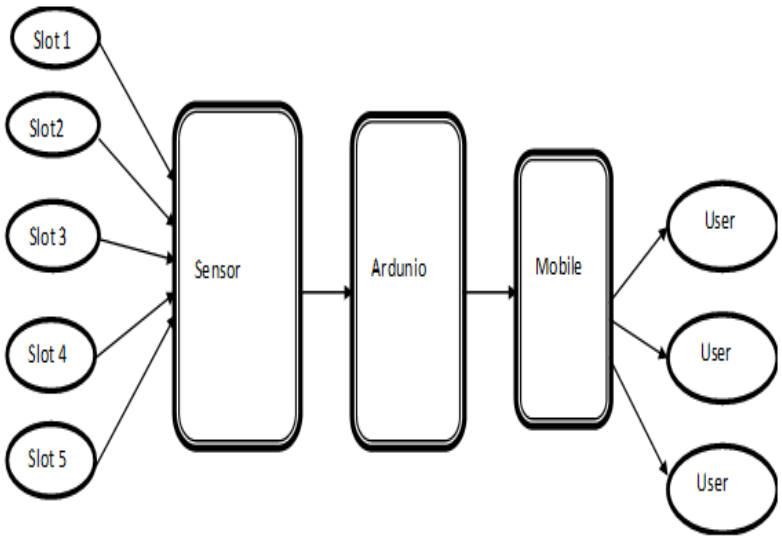
The proposed method was evaluated for 608 real-world parking situations encompassing a variety of different parking slot markings. The result reveals that the proposed method performs the previous semiautomatic method which also requires a small amount of computational costs even though it is fully automatic.

Laser radar has different types of parking aid products are being developed:(i)Displays the predicted path based on steering angle and marking the distance on the rear-view image graphically.(2)Displaying an overhead view image around the subjective vehicle by mosaic images captured from multiple cameras pointed in different directions detected by ultrasonic sensors.(3)Informing through visual or audio interface to the driver of the required steering maneuver.(4)The steering maneuver is automated to move the vehicle to an initial position for the required safe and convenient parking operation.(5)Fully automatic parking.

The preferred type of parking aid product varies according to the customer's regional characteristics. Parallel parking is predominant; customers are more interested in perpendicular parking. On the other hand, there is great demand for backward monitoring and private garage solutions. A parking aid system consists of the target position designation, path planning, and parking guidance by user interface or path tracking by active steering. H. G. Jung, Y. H. Cho, P. J. Yoon, and J. Kim[3], propose a method for the recognition of free parking space between vehicles using scanning laser radar. This proposed method consists of data pre-processing, corner detection, and target parking position designation. A novel corner-detection method consisting of rectangular corner detection and round corner detection. The corner detection develops a newly unaffected by cluster orientation and the range data interval and is robust to noise. The results showed that even in situations where other methods failed, the proposed scanning laser radar-based method would designate target parking position to viable free parking space. The recognition rate was 98.21%, and the average processing time was about 600ms. Finally, it is argued that the proposed method will eventually give a experimental solution because of the decreasing price of scanning laser radar and multiple-function integration strategies.

IV. IMPLEMENTATION

The proposed system is used to intimate the user about the vacancy of the parking slots. A user can choose the parking slot in advance, instead of waiting in the parking area, where the details of the parking is given to the user through their smart phones. IR Sensors will be attached in each slot for detecting the vacancy. The data from the sensors are collected to the ardunio and these data are changed into text format and given to the smart phones through GPS. Now the users are provided with the parking details and can choose the appropriate slots. The parking area are sensed by using the sensors which are placed in each slot. The sensors will detect each slot as input and the output of the sensors is preceded to the ardunio. Ardunio will process the input of the sensors, analog to digital conversion are made and by tracking the user using GPS the details of the parking slots are given to the user.



A. Sensor Placement

Sensors are used to detect the parking slot. Each slot is fixed with a light sensor, when a car is moved near to the sensor the radiation of the light gets changed and the changed signals are captured as analog signals. This signals will be collected to the Ardunio, the slot is detected for every 3 seconds by the sensors

B. Ardunio Processing

The data signals from the sensor are received in the ardunio and according to the change of the signal the detector will reflect to the sensors. The data from the ardunio will be transmitted to the GPS to be received to the user. GPS will transmit the data from the ardunio to the smart phones for every 3 seconds in the form of text.

C. User module

The user will view the text message and their status of the parking slots and will decide to choose the slot accordingly. The text will contain the slot numbers and also whether the slots are free or parked. The slots will be updated with necessary changes and received by the user for every 3 seconds.

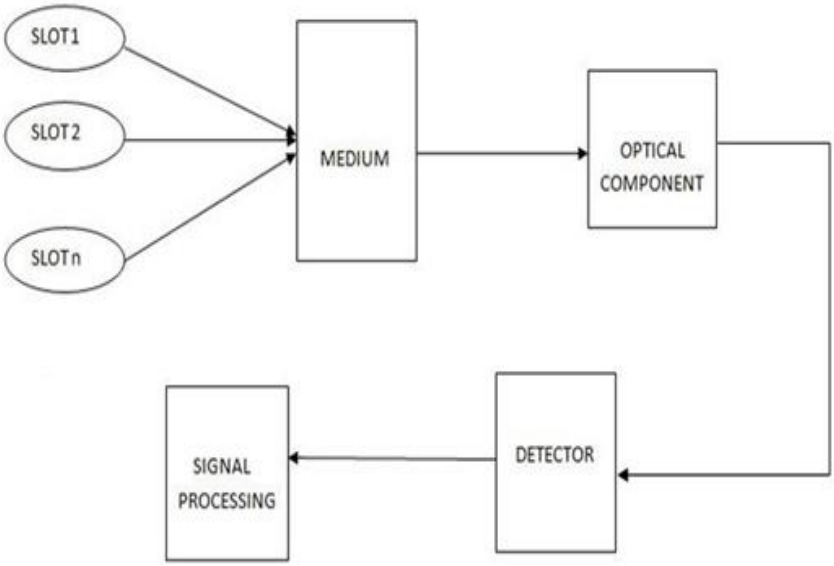


Fig 3: Sensor for sensing the slots

V. CONCLUSION

In this System the parking slots are detected by the sensors and the sensed analog signals are processed in the ardunio. The details of the slot such as slot number and whether the slots are vacant or parked is given to the user as text. The slots are updated for every 3 seconds.

VI. FUTURE WORK

In future, an android application will be developed for the user to choose the desired slot and fix the slot for an approximate time of 15 minutes. If the user cannot reach the parking at desired time then the slot will be reallocated and will be updated in the sensors.

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