

A Survey On Unauthorized Vehicle Parking Detection And Control Measures

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Abstract: As the population increases gradually, the number of automobiles are also increasing and this leads to many accidents and traffic congestions. In this busy world, people always use to park vehicles at restricted or no parking zones. When a vehicle has been parked at no parking area, the road gets narrowed and cause traffic congestion. Large number of traffic police are deployed to check the illegal parking and fine the owners so that they would not park again in no parking zone, but it's not successful solution. Therefore, various technologies has been used for the detection of the vehicles which are parked at no parking zone. In this paper, a detailed a survey on various detection methods and control measures is performed.

Index Terms: Un-authorized parking, Traffic Congestion, Detection Methods.

I. INTRODUCTION

The parking defilement is the action of parking the vehicle in the unauthorized place or in a restricted area. The present situation in major towns and cities is the ever-growing human residents along with the number of vehicles. This creates the rise and need for the multi-level parking slots. Free- parking is the most prevalent form of parking in India. In case the people planned to park in the road side but there is no vacant places, the people drive around hunting for the place. Especially in the city this problem raises because of the large amount of the vehicles with very few the amount of the parking space. In this new era, modern technology has improved the system of living and with a proper use of technology, it is possible to build a world where everything can be accomplished more easily with the support of technology. Vehicle parking management requires automation like any other field to ensure security and comfort. With the vast growth of population and increasing amount of vehicles it has become difficult to find sufficient space for vehicle parking in public places. This does not only waste our energy but also lose our valuable time. Thus, the concept of automated vehicle parking system and unauthorized parking detector has been a necessity for a while.

II. LITERATURE SURVEY

According to this survey various findings and the technologies are used for unauthorized vehicle parking detection and control measures are carried out

Adil Hilmani, et.al [1] presented the design and development of a smart parking system using the up-to-date technologies via wireless sensor network (WSN). This system utilized a versatile and mix of self-organization process for wireless sensor network that adjusts to a wide range of vehicle parking system present in the city and offered a superior managing of the energy consumption during the wireless communication to expand the lifespan of the sensor hubs and the WSN. This structure also offered innovative facilities which facilitate the task to the drivers when searching for an accessible parking spot in the city near their destination, in a quick and proficient way.

Karthika K.B, et.al [2] presented a system that uses the RFID tag, which contains a special code in it. The RFID reader is utilized to read the transmitted ID and in the event that the individual id does not coordinates, at that point consequently the alert information will be sent to the owner by the SMS notification. This is an innovative electronic parking payment system. This is utilized to produce a solution for the municipalities, and the private parking garage owners. By utilizing the RFID technology the clarification has been delivered for encountered problems in the parking-lot management system.

Sanam Kazi, et.al [3] presented an idea of reservation-based parking system to avoid traffic congestion. The system will guide the drivers to the assigned parking destination and the driver can park at the allotted slot without searching for parking slot. GPS technique is utilized for helping the driver to identify the closest parking area to the vehicle. Graphical image will be showed to the driver which shows the available and reserved parking slots, so that it will help the drivers for selecting the suitable parking slot. If the time limit exceeds than the given time, the notification will be sent to the driver.

Saifa Khantasak, et.al [4] proposed a system does video processing technique, begins with getting the first frame picture and storing it as the fixed background image. The pixels of the present picture are extracted as the foreground by thresholding the distinction between the fixed background picture and the current frame picture. Another kind of background used is a changeable background image. This changeable background image is updated for every 50 frames. Then the three-frame difference technique is utilized to discover the moving object region. This three-frame difference is acquired from the difference of the input video sequence with fixed background, and with the changeable background. Then, the framework utilizes the intersect operation of two differential outcomes in order to shrink foreground aperture due to the vehicle's speed and the frame rate.

Bhenesha Shree, et.al [5] proposed a system, where the circuit utilizes RFID reader to check the RFID tag and the data is sent to the microcontroller. After the ID is read, Microcontroller checks whether the label ID matches or not. If the ID is coordinated, LCD shows the string "ID is matched" on the LCD display and the motor movement indicates the opening and shutting of doors. The engines are operated based on the H bridge circuit. They keep up a steady voltage over the circuit and prevent the circuit from getting damage. The clockwise turn shows the opening of the door whereas the anticlockwise turn shows the closing of door.

Chihhsiong Shik, et.al [6] proposed a system consists of a mobile application, WPI NXP and Intel sensor boards. The different sensor modules comprise of Wi-Fi, ranging and geomagnetic sensor module in an arrangement. By using this device in the parking spaces above the Intel magnetic sensor, it automatically finds out the empty parking slot. NXP sensor and board light sensor are used guide the vehicle driving direction. By using a LED panel which displays the free parking slot at the junction and a mobile phone application will gives audio instructions to guide the driver approaching the parking spaces according to a unique license plate number information and available parking spaces information. Combining with the BLE technology these sensors allow quickly finding the parked spaces on the departure from visit to the nearby shopping or business sites.

Haijing Wang, et.al [7] proposed a system, altered Dijkstra algorithm is utilized to get the optimal parking space in indoor parking lot. The traditional Dijkstra algorithm is improved to compute the shortest route among the two selected points. Driving distance, the number of vehicle moved along motorway, and the occupancy circumstances of free parking lot are considered to decide the path weight. It can be proved to realize route enhancement to parking lots.

Mekala.S, et.al [8] proposed a system, with a successful solution for the parking system and also violation detection problems have been developed. The proposed system additionally guarantees the vehicle is not parked in violation areas and thus it avoids the traffic problems in high traffic city

roads. The implementation of this system consists of hardware and software. The hardware implementation involves interfacing of the IR sensor module with the Arduino for detecting the vehicle in the parking space.

Yonatan Urman, et.al [9] presented a work, with an effective computer vision algorithm for evaluating parking availability is proposed, based on unsupervised learning of parking space areas. The learning stage is depends on analysing the movement field due to vehicle's movement in parking areas, for estimating parking spot locations. A Parametric bend is then fitted to the evaluated areas, and parking space centres are recognized by utilizing the K-means algorithm. The status of each parking spot is depends on the distance of a recognized entering/leaving vehicle to the spot centre. This algorithm was tried in several real-world scenarios, with no prior information on the parking spot location structure, showed good detection performance.

Bonde.J, et.al [10] proposed a scheme of an computerized vehicle parking system instructed by an 01 application that controls the number of vehicles to be parked on assigned parking slot by presetting the Parking and un-parking of the vehicle with the assistance of the commands using an android application. This system can able to search of an empty parking slot and sends that path to the driver. The LCD module effectively shows the update in the status of the parking slots. The GSM module is effectively able to handle the sending and receiving of messages. The drivers can easily collaborate with the system through the GUI provided by the android application.

Santhosh G.Kashid, et.al [11] proposed a system which consist of image processing method for detection and identification of unauthorized parked vehicles at restricted parking zone. This study proposed a coordination of image processing procedures for detection, localization, extraction, segmentation and acknowledgement of car's number plates from obtained image at no parking zone. This system gives the instantaneous data of unauthorized parked vehicles to the respected authority through a message. This is supportive to the authority to take proper act against the holders of vehicle and makes them to vacate soon.

Shen-en Shih, et.al [12] proposed a convenient vision-based parking lot structure, which is easy to set up by a typical client with no specialized background and can recognize available parking spots automatically. This framework utilized some wide-angle cameras, such as fisheye-focal point or cat-dioptic cameras, and estimates parking spot boundary lines based on the camera model.

Liping Cheng, et.al [13] proposed a system, where the improved hierarchical A-star procedure in optimal parking path planning constructs a time varying valuation function which takes the real circumstance of the parking lot into consideration. The optimal path may be the shortest path distance, also may be a time optimal path. The design used the improved A-star procedure to rise the searching productivity and accuracy.

Yanfeng Geng, et.al [14] proposed a system with the essential structure of PGI system is used. In addition, it included a driver demand handling center and a smart parking provision center. The parking source managing center gathers and apprises all real-time parking data and spreads it via the Internet. The DRPC collects driver parking demands and real-time information, keeps track of the vehicle driver distribution status, and sends back the outcomes to drivers. Based on driver demands and the parking empty slot states, the SPAC creates assignment decision, assigns and reserves parking slot for drivers.

Yang Jun, et.al [15] presented a work which is developed to overcome the limitations of urban parking guidance system where it includes four parts which are System of communication, Guidance service center, Guidance analysis center and Data center. This system can take part in the process of making driving plans and affect the traveler's act directly to attain the goal of effective control by point-to-point interface between system and traveler.

Zhang Bin, et.al [16] proposed a system, which consist of the Intelligence transport System, which as a perfect method of tackling traffic problem. It is emphasized by international locations, and it has been practiced in many advanced nations. Intelligence transport system is an idea of multi-technology. It is the integration of cyber-technology, electronic technology, information technology, system engineering and so on, which is based on the completely roadway's establishment. The intelligent management of parking lot is an important project in that of Intelligence Transport System, which can change the confusion of parking lot management and increases the proficiency of parking space. Parking space detection, as one of the crucial technology of intelligent management system of parking lots, can provide real-time inspect information of parking space occupied, so significant in intelligent management of parking lot as it is.

Summary: From the above surveyed papers, it is evident that exhaustive research has been already done by various researchers using various technologies for detection of illegal parking vehicles and control measures. There is no system available for auto locking the vehicle, if it is parked at unauthorized zone.

III. PROPOSED METHOD

In the proposed method fig.1, the RFID reader is set under the vehicle which is connected to an Arduino UNO and RFID tags should be mounted on the road at no parking zones. If a vehicle is parked in a zone where the parking is prohibited, RFID transmitter which is set under the vehicle comes in area of the RFID tag which is mounted on the road. Once this happens, the RFID reader read the transmitter ID and displays a warning message on vehicle's dashboard display using the Arduino which is programmed for it and the system provides 60 seconds countdown with continuous warning to the driver using buzzer and red light in dashboard. Still if the vehicle owner does not move the vehicle after 60 seconds of countdown, locking mechanism will be activated by terminating the power supply to vehicle's engine using a relay. Then the traffic police arrives and release the car after getting the penalty amount. This is 100% practically implementable in real-time

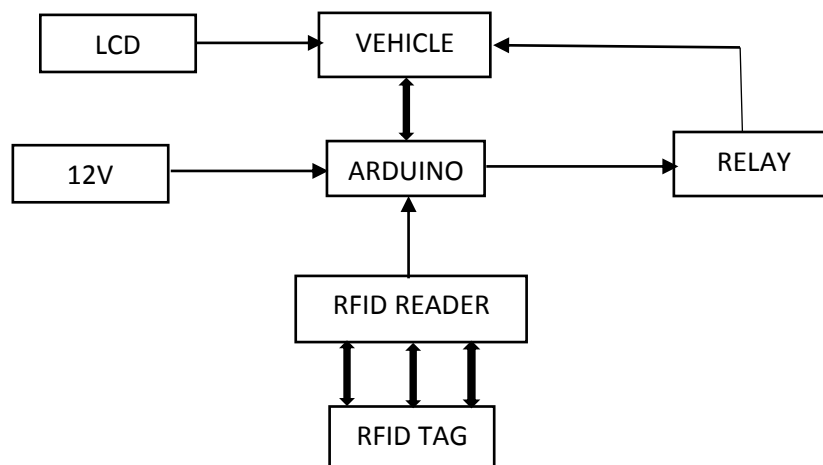


Fig.1 Block diagram of unauthorized vehicle parking detection and locking mechanism

IV. Conclusion

Various technologies used to detect the unauthorized vehicle parking detection and control measure are summarised in the above survey. It is evident that there is no locking system is been proposed to lock the vehicle. This proposed framework will be helping to avoid unwanted accidents and traffic congestions. By using this automated system, illegal parking can be easily avoided without the presence of traffic police or CCTV camera, this system will not require the physical presence of a

human at restricted parking area to take action against illegally parked vehicles. This system offers a new solution to the evolving technology such as saving time and manual effort and safety purposes. People can have a clear idea of parking status by their dashboard notification itself. This system functions efficiently and recommended for commercial implementation.

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