RFID and Number Plate Based Two Level Authentication System for Vehicles

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ABSTRACT

The objective of this project is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate and RFID. The developed system firstly detects the vehicle RFID and then it captures the vehicle number plate. Here Vehicle number plate is extracted by using the image segmentation and Optical character recognition technique which is used for the recognizing the character. And then resulting data is used to compare with the records on a database and data extracted from RFID. And in database there can be specific information like vehicle's owner name, place of registration, or address, etc. If the ID and the number are matches with the database then it show the message "authorized person" else "unauthorized person". Both should be match with the database. If single one condition is true then it shows "unauthorized person". Here the system also adding the advantage of identifying and auto information about theft and crime vehicles.

Key words: RFID, ARM7, MATLAB, OCR

1. INTRODUCTION

During this project we have a tendency to describe the primary steps in project of style of system guaranteeing improved security processes, optimization and automatic method management for entrances and exits to and from the non-public parking areas of business entities. The identification and registration of vehicles at the doorway and exit into and from the non-public areas is an integral a part of

the security operation. The foremost common resolution is proof in a very paper type, sometimes in a very book at the entry purpose. Additional recently, this drawback is resolved by exploitation erp systems, wherever data is being recorded to the information.

The most disadvantage of those choices is that the necessity of hand-writing, whereas intentional or unintentional errors will occur. Goal of this project is to modernize the present system and style of the new solutions for identification and registration of vehicles supported rfid technology. Frequency identification technology, as a result of contactless manner of identification of things and objects, provides higher and safer solutions, particularly in conjunction with a camera system. Double identification will give higher level of preciseness and conjointly ensures the responsibility of identification compared with the camera system alone, wherever solely optical vehicle registration plate recognition is employed.

These days it's potential to return across many alternative systems for parking. Method, that is already virtually on the wane, however it's still usually used, is that the presence of guard (guard parking lot). He exposed the ticket to the motive force at the doorway to the building, secured parking. Once automobile exploit a parking spot, the motive force show this ticket to the guard and supported the time spent within the parking spot, he pay increased quantity.

Trendy technique is to use machine-controlled systems wherever the motive force of a automobile at the

doorway to the ability stopped before gate, the machine issued the price ticket and once you take away it.

The gate is opened and also the driver will simply enter into the building. Timestamp distinguishing the time once the motive force entered the article is keep within the universal product code, that is on the list. At a time once the motive force needs to go away the parking lot, the primary within the payment terminal to acquire time spent within the automobile parking space. The information for the given universal product code assigns the knowledge that the payment was done and also the driver will leave the parking lot. The motive force later connected the park price ticket to the universal product code reader once exploit.
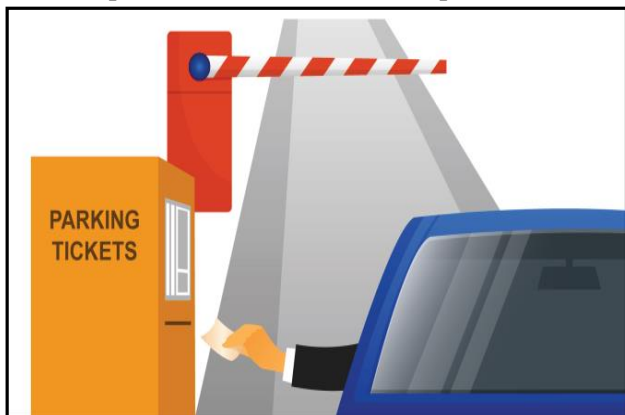

Figure1. Parking technique that exploitation parking tickets for getting into

2. RELATED WORK

Most images you find on the Internet are JPEG-images which is the name for one of the most widely used compression and standard of the images. If you stored an image then you can usually see from the suffix that in what format it is stored. For example, an image named asimage.jpg then that is stored in JPEG format and we will see later on that we can load an image of this format into MATLAB. Working formats in MATLAB: If an image is stored as a JPEG-image on your disc we first read it in MATLAB. and, in order to start working with an images, like perform a wavelet transform on an image, we must convert image format into a different format.

RFID TECHNOLOGY

RFID is AN abbreviation for frequency Identification. Currently, the foremost growing technologies within the field of automatic identification. This is often as a result of the flexibility and therefore offers a really numerous vary of pertinence of this technology in varied disciplines of human action. We will mention e.g. To communicating services and its logistical chain and identification of communicating things and transport units.

Nowadays, the identification is carried through barcodes and optical character recognition, however there's a shot to deploy RFID technology to whole logistical chain and it exists theme of the transport method, as well as planned technology and simulations of a true communicating method in conditions near operational. From the many of application areas for RFID technology will be named.

The technology for contactless automatic identification technique while not necessity of line of sight. This technology is predicated on the principle of operation of magnetic force waves. Magnetic force waves are used because the data transmission and storage of data. RFID technology, however, despite its huge potentialities and benefits, which is able to be delineate later, isn't as rampant because the barcode. The explanation is value.

3. PROPOSED SYSTEM

As was mentioned earlier, it is very frequent identification using camera recognition of registration plate vehicle in private (closed) objects. The actual use of the system, however, has significant drawbacks.

This system also allows to automatically open the entrance gate to the facility based on the registration plate. Using camera system with recognition of vehicle registration plate removed guard errors, but creates other. Above all, the issue of poor readability of registration plates or possibility of plagiarism. The system is not in this case be able to recognize whether it's original or fake and the car entrance to object. Our

proposed solution is to use RFID technology to identify vehicles at the entrance and exit to the closed objects. The camera system in this case will serve as a supplement to ensure higher security.

The principle of the solution lies in the marking of vehicles that regularly drive onto the private object (suppliers, customers or employees) by RFID tag. The RFID tag is used to identify the vehicle (Figure 3.1).

Figure 3.1 Proposed system architecture

3.1 BLOCK DAIGRAM OF PROPOSED SYSTEM
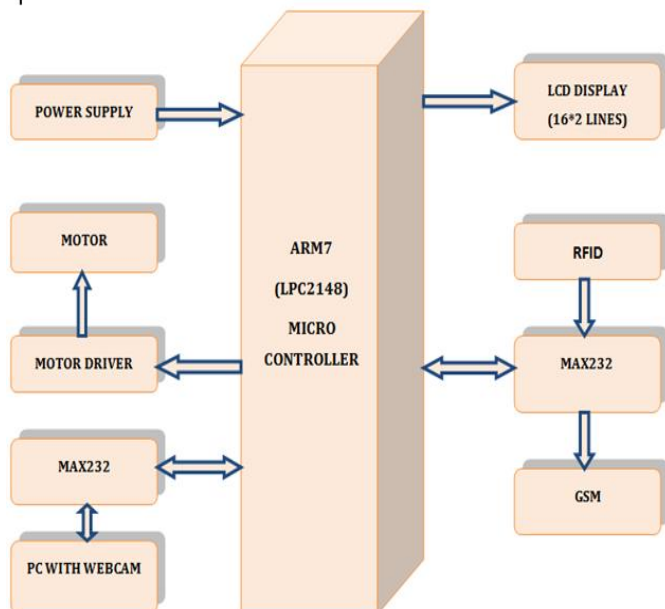
3.2 Description

When the vehicle comes to a radiating field of the antenna the unique identifier of the RFID tag in the form of a unique code is read. In the event that the

identifier is kept in a database, the gate is automatically opened. It is an automatically generated the record to the register of entrance and exits refer to with unique identifier and time and place of entry to the premises. The camera system may have two functions. Either can be used to identify the registration plate of the vehicle and if the unique identifier stored in the tag and identification using registration plate camera system to coincide with the information contained in the database, it will automatically open a gate and driver can continue without stopping driving up to desired place. The proposed system also providing the option to identify the theft or crime vehicle with the help of number plate recognition and pass the information to the corresponding owner of the vehicle and police station.
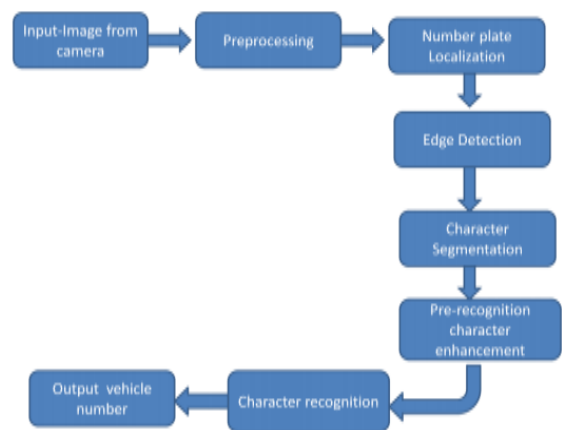
3.3 NUMBER PLATE RECOGNITION SYSTEM

Figure 3.2 Flow chart of number plate recognition system

3.3.1 .Image acquisition
The input image for pre-processing is a gray-scale image taken from an Infra-Red (IR) camera.

3.3.2 Image Pre-processing
Pre-processing has to be performed by taking into account the background illumination conditions and the number plate localization algorithms. It is important to eliminate as much background noise as

possible, contrast enhancement and de-blurring in the pre-processing step itself to optimize the localization algorithm and also save the processing time. For pre-processing we are going to use some matlab function which will help in preprocessing of the image.

3.3.3 Number Plate Localization

Recognizing the number plate from the image of the vehicle taken in previous step using appropriate algorithm is term as number plate localization or simply finding out ROI i.e. Region of Interest. This step recognizes the location of number plate in captured image so that it will be easier to recognize the number by using only that part of the captured image. The output after localizing the number plate is than inputted to the edge detection algorithm which improvises the edges of characters in the image. By the previous step gives more sharp and clear edges in the image by applying algorithms the edges are classified so that the given set of edges will help to recognize the character.

3.3.4 Segmentation

Character segmentation is the method which separates character present in the image.Methodologies available
1 Transform method (Ex-Watershed)
2 Texture method (Ex-Texture filter)

3.3.5 Recognition

of individual character with the help of mapping with database The characters thus obtained are mapped with the database so as to find licensed user of that number plate and result is displayed. The system will make use of Artificial Neural Network to perform the task of Pattern Matching. These Artificial Neural Networks will be trained on various image samples before final release of the system.
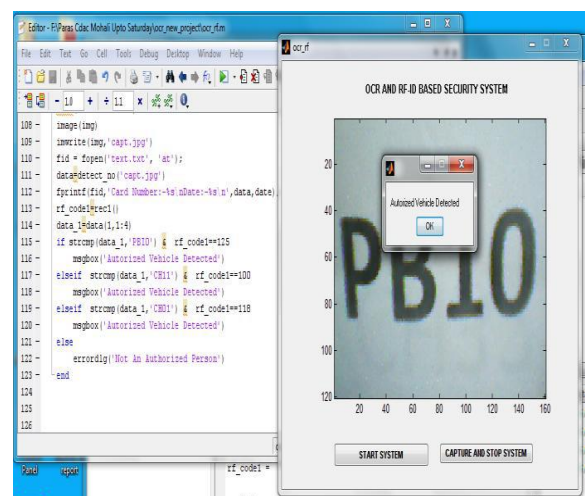
4. RESULT

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The screenshots of the developed system has been presented in Figure bellow.
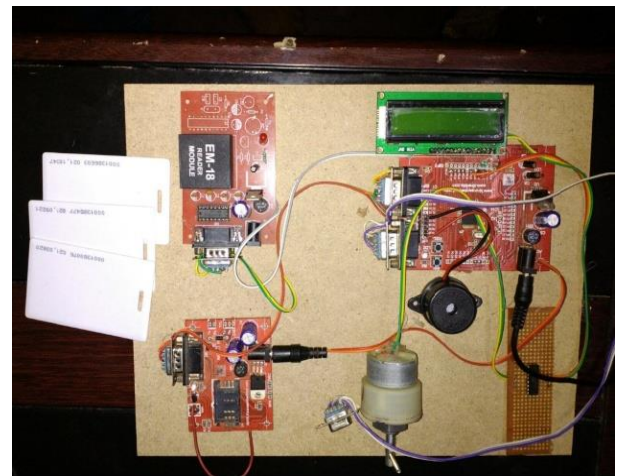
Hardware implementation of proposed system
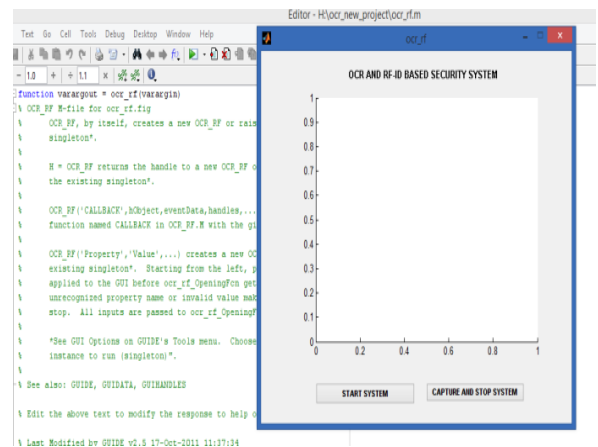
After running the matlab code

Identifying the number plate

6. CONCLUSION

The automatic vehicle identification system using vehicle license plate and RFID technology is presented. The system use series of image processing techniques for identifying the vehicle from the database stored in the PC. The system is implemented using MATLAB and Embedded system it performance is tested on real image. The MATLAB results shows that the system robustly detect and recognize the vehicle using license plate against different lightening conditions and can be implemented on the entrance of a highly restricted areas. The implementation works quite well and thus there is still room for improvement.

7. REFFERENCES

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