Cloud Based Anti Vehicle Theft by Using Number Plate Recognition

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ABSTRACT –The growth of technology is increasing day by day to fulfill needs of the humans. The proposed system is implemented to make human work easier. Anti-Vehicle Theft Using Number Plate Recognition in Cloud is an image processing technology with cloud computing environment which uses number plate to identify the theft vehicle. The objective is to design an efficient automatic theft vehicle identification system by using the vehicle number plate. The system is implemented on the public places like check post, toll gate and police checking. The proposed algorithm consists of four major parts: Vehicle identification,Extraction of number plate region, Recognition of plate characters and compare with cloud database.Moving object detecting algorithm is used for vehicle identification. For extracting the number plate Smearing algorithm and segmentation are used. The characters and numbers are recognized by using OCR technique. The extraction result is then used to compare with the database so as to come up with the specific information like the Vehicle's owner name and address, place of registration, vehicle's number and RC book details. The developed project is going to be implemented and simulated in Mat lab, and its performance is testing on a real image.

Keywords - Vehicledetection,Extraction of plate region, Classification of a vehicle, Recognition of plate characters.

I.   Introduction

Anti-vehicle theft using number plate recognition in cloud plays an important role in numerous real-life applications. This system is implemented in tollgate, check post and police checking to identify the vehicle theft. The main motto of Anti-vehicle theft using number plate recognition in cloud is reducing the vehicle theft throughout the entire country. The main reason for implementing this system in cloud environment is the police department will easily identify the theft vehicle in other state also because cloud is a pooled resource i.e. Cloud computing provides a network, including data storage space, shared pool of resources, specialized corporate and user applications and computer processing power**.** All the vehicle details are stored in cloud database so it willmake easier to identify thestolen vehicle which was under consideration.

Automatic Number Plate Recognition or as frequently called 'number plate recognition' is a special form of optical character recognition (OCR). License plate recognition (LPR) is a type of technology, mainly software, which enables computer systems to read automatically the registration number (license number) of vehicles from digital pictures. Transformation of pixels of the digital image into the ASCII character is the automatic reading of the number plate. The license plate recognition has special type of OCR technology, today optical character recognition (OCR) technology is considered strictly a type of technology - mainly software - that scan the paper documents and convert them into editable files. Special camerais needed to avoid motion blur which can decrease the recognition accuracy dramatically to capture the fast moving vehicle. IR is the best illumination   retro-reflective plates, because it reflect this kind of light very well and it is not visible for the human eye. This will work well during day and night and provides constant good image quality. ANPR cameras are needed to meet these requirements, like AHRs ANPR cameras, which provide flexible shutter control with built-in IR flash and able to catch the vehicles up to 250km/h which is suitable for all kind of license plate reading applications.

II.   Proposed system

Anti-Vehicle Theft Using Number Plate Recognition in Cloud is to identify the theft vehicle in an efficient way. The theft of vehicle becomes major problem in this competitive world. Based on number plate recognition technique theft vehicle can be easily bounded. In this technique the details of each and every vehicle is predefined in the cloud server. Storing the data in cloud become easy and secure one, if RTO offices use cloud server for storing purpose at the time of vehicle registration. In this system new and secure number plate called High Security Registration Plate (HSRP) is used uniformly all over the country which was partially implemented.

A. HSRP

A High Security Registration Plate is a highly secure number plate aimed to bring about a uniform pattern of displaying registration marks across the country. It helps to easily identify the vehicle using camera in the public places and also helps to reduce the vehicle theft. HSRP plates are made of aluminum featuring unique details apart from the registration number. The number plate have a unique seven-digit laser code, a self-destructive sticker with the engine and chassis numbers of the vehicle, chromium-based chakra hologram to prevent counterfeiting, 'IND' inscribed in blue color, with India inscribed at a 45 degree angle in hot stamping foil across all letters and numbers on the plate and it has a non-removable and non-reusable snap lock.

B. Snap lock

The snap lock will attach the number plate in place on the vehicle. Any attempt to replace or remove the snap lock will cause the lock to break which makes it impossible to install any other number plate on the vehicle. The replacement of HSPR due to any damage can be provided only by the RTO.

C. Laser code

The unique seven-digit laser code is the biggest safety advantage. It is meant to be scanned by laser detector cameras to determine if the number plate details match the laser code and whether or not the registration plate belongs to the vehicle. So the laser detector camera will have to be installed on roads. Thesetype of cameras are not present in India so far and will have to be imported. The cameras are installed on fixed positions or used as hand-held devices. The cameras also do the recording details of speeding vehicles.

III. Working process

This system is implementing to identify the theft vehicle all over the country. The laser detection camera is used to identify the number plate. It captures the whole image of the vehicle and then locates the location of the number plate. The located number plate is now extracted and divides the number plate into number of segments. By using OCR concept the segmented character image is converted into ASCII value. After converting the image into character, the character value along with the laser code is sent to the cloud provider. For this purpose the system used to calculate the vehicle's number should configure with the cloud provider i.e. the API used to access the cloud provider is installed in the computer. In cloud server it compares the registration number and laser code with the database which is already stored and return the result to the respective system from which the request is sent. If the registration number is fake or registration number and the laser code is not matching then the alert message is sent to respective else the alert message is sent to the system as well as the mail is sent to the person who registered a complaint if complaint is in process.

IV. SYSTEM DESIGN

The process can be started by activating the camera. The camera used here is the laser code detection camera. It is useful to detect both the number from number plate and laser code in it. It will search for camera until the camera is active. Once the camera is activated then it searches for vehicle images. After the capturing of image the number plate recognition method is finding for the location of the number plate. After finding the location of the number plate the located region is extracted using extraction method. The extracted plate is in image format, and then the number from that image is extracted using optical character recognition method. At the end of this technique the number and the laser code from the number plate is in digital string format.

Now the character is sent to the cloud environment through internet. In cloud environment the database about each and every vehicle is stored and also the complaints registered about any vehicle are stored. First compare a number with the vehicle's owner detail database. Here it checks the registration plate is valid or not. If the registration plate is not valid then it sends the alert message to the computer where the validation process is requested. Otherwise it checks for any complaints under police station from all over India is registered. If any complaints under the respective vehicle are found then it sends the alert message to the system from which

the request is sent and also mail to the person who registered the complaint. Otherwise the message with vehicle details is sent to the respective system that the vehicle is genuine. The overall process and the transaction are done through the internet.
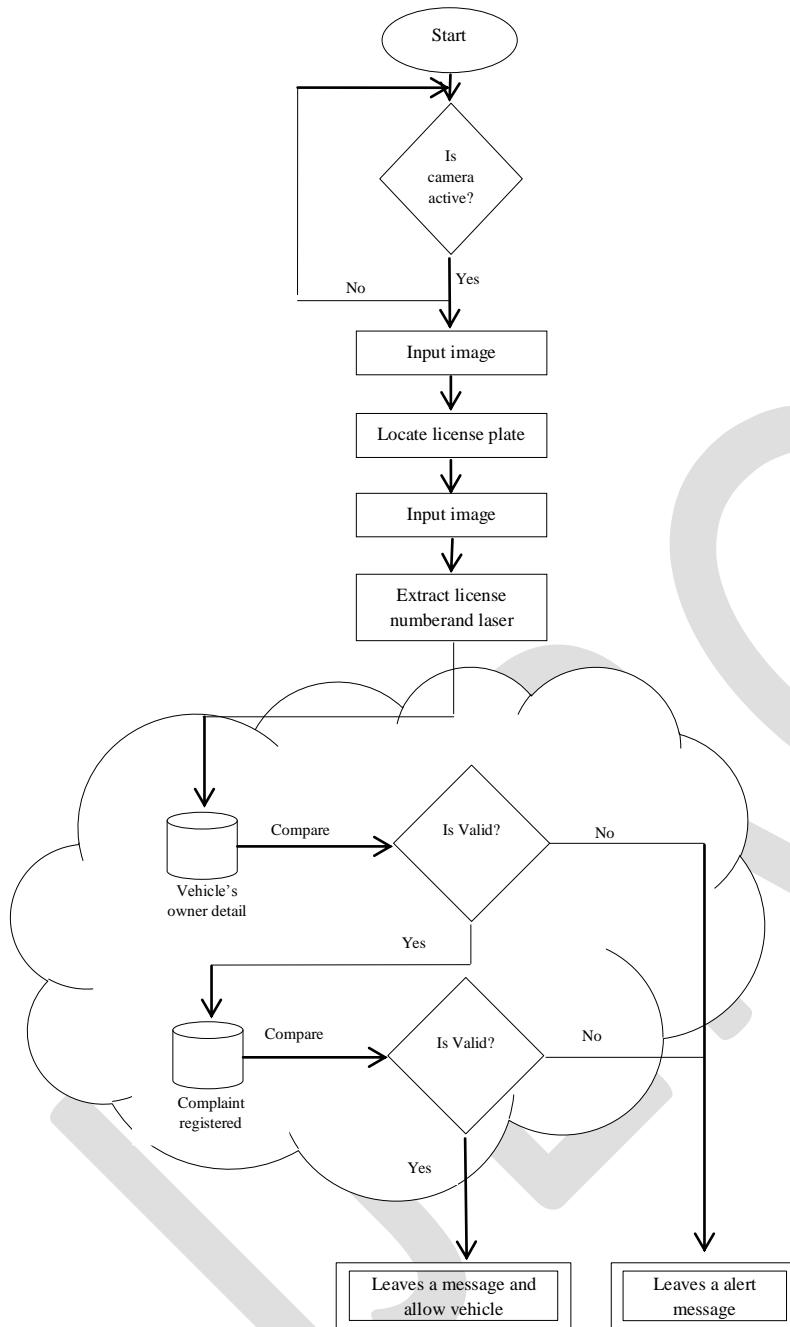

Fig 1.1 System Design For Anti Vehicle Theft Using Number Plate Recognition in Cloud

V. Implementation

A. Extraction of image

The captured number plates are cropped using edge detection algorithm.Filtration of the images improve the image resolution and the final image is segmented to extract each number. The standard format of each alpha numeric image is predefined in the database. The extracted image is matched with the database by comparing the matrix value. If the captured image is matched in the database then respected string value is returned.

B. Designing user interface page

In the designing of user interface page, the login details are provided to the authorized person but not to everyone. It is mainly focused to implement in a tollgate. After creating the login details, the authorized persons can check the updates and match the extracted string with the database to find the status of the vehicle. While matching the returned string value is sent to the cloud database. To find the theft vehicle it is mandatory that the owner should registered a complaint in the police station. If the number matches then the alert message is sent to the respective device from where the request is sent.

C. Testing the application in private cloud

The whole process is developed and tested in private cloud using Microsoft Windows Azure platform.

D. Implement the application in public cloud

After testing process is successfully finished in private cloud it can be move to public cloud for implementation.

VI. Conclusion

Anti-vehicle theft using number plate recognition in cloud is implemented in tollgate to identify the vehicle. Nowadays, vehicle license plate recognition system has become a key to lots of traffic related applications. Extracting the number from the number plate is one of the most important stages. Anti-vehicle theft using number plate recognition in cloud consists of two modules, one for extract number from number plates and one for verifying extracted number and user details in cloud database. In additions, it can be applied to all kind of license plate and it is not sensitive to complex background, non-uniform illumination condition and inclined license plate. Anti-vehicle theft using number plate recognition in cloud implements the system to find the stolen vehicle in an efficient way and to recovery the vehicle. The proposed system is implemented in tollgate to identify the vehicle. After the successive of this, it can be upgrade and implement in the public places like traffic signal, petrol bunk, and check post and so on. It is very useful to find the vehicle where it is. If the theft vehicle is caught by the camera then the current information about the vehicle is send to the database it can be seen by police department. By using this method will reduce the vehicle theft and also culprit will not escape. The proposed system will reduce the cost of infrastructure.

The number plate recognition technique is tested under MAT lab and the virtual environment is created under the private cloud for testing purpose in Windows Azure. After the completion of testing it can be tested on the public cloud. It is very useful to find the vehicle where it is. If the theft vehicle is caught by the camera then the current information about the vehicle is send to the database it can be seen by police department.

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