Vehicle Identification Using Android Enabled Mobile Devices

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Abstract- *Now a day's Vehicle identification is an important area of research for improving methods of vehicle recognition in public and private places. When GPS tracking is not available and the license plate number is missing or unknown then how to find the vehicle information is really a big challenge. To overcome this issue, we are proposing Vehicle Identification System which is a QR code based system that will help in identifying the vehicle in public or private places like Traffic signal and Society, buildings, parking respectively. This quick and robust system will propose to detect and describe features of a vehicle image, specifically in an android application using QR code mounted on vehicles. After description of QR code it fires the query on database for searching information in the database. Real time android applications are the real challenges for this system. By using this system vehicle tracking and tracing is going to become comparatively easy task for the people who may or may not be technically competent.*

Keywords:- Vehicle Identifcation, QR code, Encoder, Decoder, XML files, Database, SQL query, Data Validation, Buzzer system.

I. INTRODUCTION

Due to increased number of vehicles running on street, roads the high congestion in traffic is been realized frequently. Also because of the strict time constraints people violate the traffic rules and manier time create hit and run cases. Moreover, parking in the private areas such as apartment's parking and public areas such as complex parking, there is a need to have the vehicle identification system to identify unauthorized or illegal vehicles.

Our propose vehicle identification system is the potential solution to overcome the above said problems through QR code technology. Quick Response (QR code) is a type of matrix barcode or two dimensional barcode, main purpose of QR code is identification. For example, license plate number plate number is absent or unknown. But this technology having many challenges the challenges are building system for detection and description of vehicle using QR code [3].

This proposed work provides the following contribution to the study of vehicle identification. Firstly, any smart phone handset camera images are sufficient for vehicle stick QR code recognition with computer vision algorithms. Secondly mobile optimized algorithms can process QR image in real-time on a mobile platform and the android application presents an easy-to-use interface for users to identify vehicle.

1.1 Literature survey

The paper presented by Thomas Cooper Describe an idea about Automobile Identification Using Android [1]. Vehicle identification is also of interest to the general public. Users of this technology are provided with relevant information about a vehicle within an augmented reality application [2].

The paper presented by Chirag Patel gives an idea about cases of 'Hit & Run' have increased tremendously, but for identifying the real guilty person, the technology (ANPR) we are using is not getting upgraded with the time. Also, there is no way to detect manipulations in number plate of vehicle. So if we are able to develop the system which can overcome all of the mentioned drawbacks, then definitely it would help us to improve citizen security. [5]

The paper published by Yue Liu and team focuses on an image processing system based on embedded system is described to be able to binarization location segment, and decoding the QR code [3]. In order to adapting various gray-level values, and under various lighting conditions of real bar image, a high-speed, high-accuracy binarization method is developed, which can locate the finder pattern accurately and integrate the local thresholding method with global thresholding. Experiments have shown that over 99% over barcode can be recognized with proposed algorithm. It can achieve higher recognition rate of high density barcode, and is applicable to real world scene image [4].

II. BASIC IDENTIFICATION PROCESS

The main functionality of the system is to identify and log the vehicles passing through camera. The system consists of various phases viz. Encoding, Decoding, Data retrieval, Data validation and triggering an alert. Whenever a vehicle with invalid identity is detected, system will buzzer

[1]. The Fig.2.1 shows the actual identification process of vehicle, where we are mounting the QR code on vehicle. After mountaing QR code, This QR code is captured by camera and then the Identification does his work. next process will done as describe in next section that is proposed system.
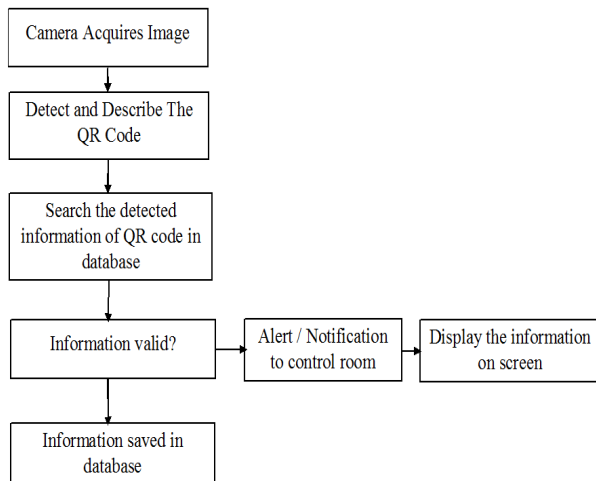

2.1 Block Diagram of Vehicle Identification system

III. PROPOSED SYSTEM

This application could capture live images from camera. It gets approximate region of QR code, and implement positioning for QR image according to finder patterns. Implement the accurate positioning as that of alignment pattern. After that this barcode can read and understand by computer using machine vision system consisting of cameras and barcode interpreting software [1].

For decoding the QR code it uses the binarization method. After decoding information of QR code. This decoded file is saving in database. When we want to search information then this operation is done by SQL Query. When information could match with precompiled database of automobile to identify the target vehicle then display this information on screen.
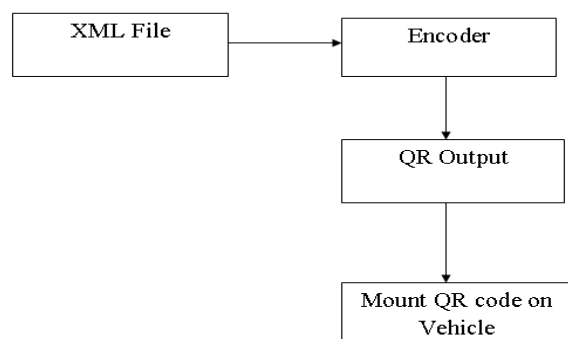
1.2 Block diagram of encoding of QR code
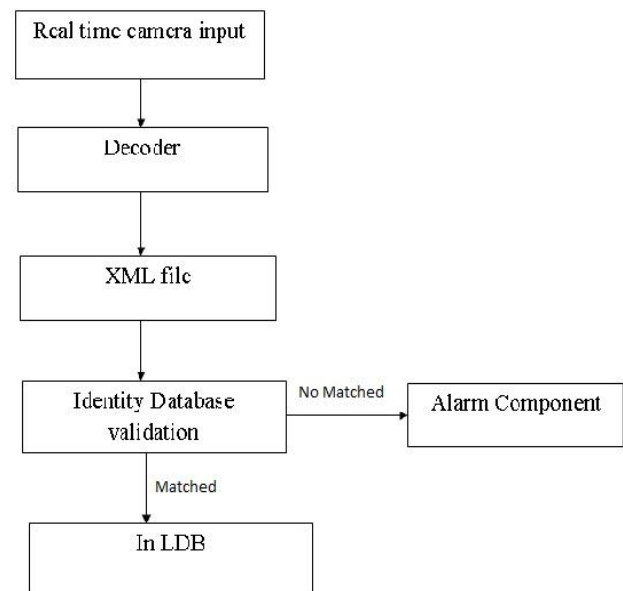
1.3 Block diagram of Decoding of QR code

IV. CHALLENGES

4.1 Encoding data into QR code:

We are going to modify and reuse QR code encoding algorithm in order to bring uniformity in the project.

4.2 Recognizing QR code:

We have to put the camera on continuous image capture mode in order to capture each and every vehicle passing through the system.

4.3 Decoding QR code:

By reversing encoding algorithm, we are going to decode the particular.

4.4 Making entry in database and further database operations:

Decoding will bring the original information in tabular format which is then going to be used for trigger operations and comparisons.

4.5 Buzzer for invalid QR detection:

As we are collecting the database of vehicles, ultimately we are going to compare its values with predefined database of RTO. If anyhow the comparison returns with negative feedback, then the buzzer will sound.

V. STEPS FOR ENCODING AND DECODING OF QR CODE

5.1 Encoding data into QR code:

The encoding data into QR code steps are uses many algorithms steps together for implementation of QR code image. The QR code Encoding steps are as follows:

- In the first step of basic QR Code algorithm it calculates an upper triangular Matrix T and Unitary Matrix U.

- After that the Hessen berg QR step calculate the Upper Hessenberg Matrix.

- Then reduction to Hessen berg form it using by sequence of Householder Reflection.

- The Hessen Berg QR algorithm with Rayleigh it uses the quotient shift it computes Schur Normal Form H=UTU*.

- The francis double step QR algorithm Computes Real Schur form T=UTU Transition

- Symmetric traditional QR algorithm with implicit Wilkinson shift it uses the Symmetric Traditional Matrix with Diagonals values and Computes Eigen values.

5.2 Decoding of QR code:

The Decoding Steps for QR code are as follows:

- Binarization.

- Get the approximate region of QR code, and implement positioning for QR image according to the finder patterns.

- Implement the accurate positioning as that of alignment pattern

- Calculate the angle of inclination to rotate QR image, and then implement process of rectification.

- Get the version number and implement self-adaptive sampling.

- Decode based on the corrected image and input the standard 2D matrix.

VI. CONCLUSION

As the Smartphone's with camera device is getting more advanced, recognition of barcode based on Smartphone is getting more important and practical; the term here we mentioned that new high–speed, high- accuracy automatic recognition method for recognizing QR Code symbols any

conditions for vehicle identification. The recognition test also showed the proposed method is effective for the vehicle identification using QR Code image recognition based system.

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