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**INTEGRATION OF TOWING ABANDONED VEHICLES WITH NUMBER PLATE
RECOGNITION SYSTEM**

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ABSTRACT

Traffic Police Tow/Carry abandoned vehicles without notifying vehicle owner. Owner gets panic when he came to know after a long time. Even Towing people don't give exact info. what which police station the owner should contact. Towing contractors demand huge amount to free vehicle. Some time the vehicle gets damage due to improper handling. Basically, owner has no problem if its abandoned vehicle is getting carry by traffic police, but he/she wanted a notification of same. So, there is a need of such a system which can help Vehicle owner, Traffic police and Towing Contractor to solve all types of problems.

KEYWORDS: Android Phone, camera, number plate, server, towing agents.

INTRODUCTION

If we park our vehicle in non parking area, traffic police will tow our vehicle. Traffic Police Tow/Carry abandoned vehicles without notifying vehicle owner. Owner gets panic when he come to know after a long time Even Towing people don't give exact info what which police station the owner should contact. This is because; the traffic police cannot tow/carry any vehicle without a written order (Panchnama) from the traffic constable. So, there is a need of such a system which can help Vehicle owner, Traffic police and Towing Contractor to solve all types of problems

MATERIALS AND METHODS

Algorithm -

Image Capture and Pre-processing:

The images will be stored as colour JPEG format on the camera. Next, we will to convert the vehicle JPEG image into gray scale format.

Input of this system is the image captured by a camera placed at a distance of 1-2 metres away from the vehicle as shown in following

When an image is acquired, there may be noises present in an image. These noises affect the recognition rate greatly. So these noises should be removed from the images. To remove noise from the image FIR filters are used so that image becomes free from noise.

Plate region extraction.

The goal of this phase, given an input image, is to produce a number of candidate regions, with high probability of containing number plate and validate for true number plate.

- i. Image binarization: Covert gray scale image into binary image using Otsu's method.
- ii. Edge Detection : Sobal Operator
 1. Sobal Edge Detection

- iii. Now we can detect an area of the number plate according to a statistics of the snapshot using vertical projection of an image into the axes x and y.

The vertical projection of the image is a graph, which represents an overall magnitude of the image according to the axis y:

Segmentation of character in the extracted number plate.

The segment usually contains several pieces. One of them represents the character and others represent redundant elements, which should be eliminated. The goal of the piece extraction algorithm is to find and extract pieces from a segment of the plate. This can be done using “horizontal segmentation” technique.

Since the segment has been processed by an adaptive thresholding filter, it contains only black and white pixels. The neighboring pixels are grouped together into larger pieces, and one of them is a character.

Comparison with database.

In this step get the o/p of extracted number plate using labelling components, and then separate each character and split the each and every character in the number plate image by using split and also find the length of the number plate, then find the correlation and database if both the value is same means it will generate the value 0-9 and A - Z, and finally convert the value to string and display it in edit box, and also store the character in some text file in this code

A) Architecture

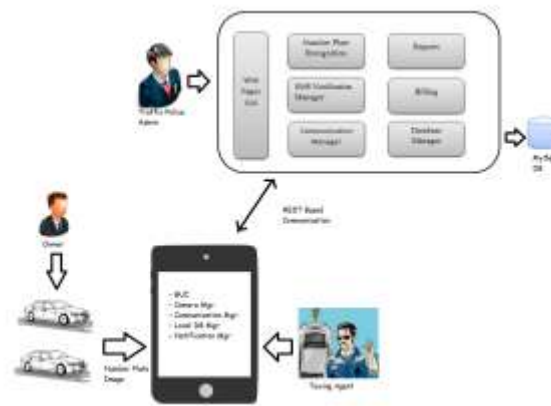


Figure 1.1 Architecture of Towing system application

RESULTS AND DISCUSSION

Feasibility Analysis

Towing System: Given a failure case viz. Q, No Mobile App & invalid number plate details, we devise an algorithm for this problem as follows:

For a Problem P1 to be NP-Hard, Satisfiability problem (SAT) must be reducible to P1;

SAT ≤ P ;

Let the propositional formula be: G = X1^X2

Where

X1: True if towing agent’s mobile application is not running

X2: True if number plate details are invalid

Algo sati()

```

{
  For i: 1 to 2
    xi = Choice(True,False);
    if G(x1,x2) then
      Success();
    Else
      failure();
}

```

Therefore, since the problem becomes a decision problem, it is **NP**.

Satisfiability and Reducibility:

3 SAT problem is NP Complete. The system can be reduced to 3SAT problem. A 3SAT problem takes a Boolean formula S that is in CNF in which each clause has exactly three literals. 3SAT is a restricted form of CNF-SAT problem.

x_1 – Traffic Police Admin

x_2 - Towing Agent

x_3 – Vehicle Owner

$S = (x_1 \wedge x_2 \wedge x_3)$

```

Algo sat()
{
  For i= 1 to 3
    Xi=Choice(true, false)
  If(S(x1,x2,x3)= true)
    Success()
  Else
    Failure()
}

```

As it is polynomial time. It is NP-Complete

Mathematical Model

1. Set Theory Analysis

Let 'S' be the "Towing Application Using Number Plate Recognitions"

$S = \{S_1, S_2, S_3, \dots, S_n\}$

Set S is divided into 6 modules

S1= GUI Handler (GH)

S2= Location Manager (LM)

S3= Camera Module (CAM)

S4= Number Plat Recognition (NPC)

S5= Google Map Handler (GMH)

S6= Database Manager (DM)

1. Identify the inputs as I.

Inputs = $\{X_1, X_2, X_3, \dots, X_n\}$

X1= Number Plate Image
X2= Fine Amount

2. Identify the output as O.
Outputs = {Y1, Y2, Y3,Yn}
Y1= SMS Notification
Y2= Reports

CONCLUSION

we are trying to achive number plate recognition system for corruption avoding using android system Application.we trying to solve problem of number plate recognition algorithm,and NP complete problem of of number plate reconigation through algorithm. Using this application It help To find the victim vehical and avoid panic sitsution.

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