

SBML ALGORITHM FOR INTELLIGENT FUEL FILLING (IFF) AND SMART VEHICLE IDENTIFICATION SYSTEM (SVIS)

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Abstract : Current trend fuel filling method is very difficult to manage the crowd in the fuel filling bunks. They have spent more time for filling fuel and collect the cash. During this time delay the consumer also suffer and fell very bad for this fuel filling method. In our research we observe the above problem and provide a simple solution for the problem with our SBML Algorithm. On any fuel filling bunk they need to fill the fuel and collect the money manually but we are trying to do this process in an automation way and reduce the queue so automatically we reduce the waste of time inside the fuel filling bunks. Here we are using a camera for capture a front and back look of a vehicle and match the front and back formats and numbers. If both are same then we start a search weather the number is present inside the Central database or Police Database. If it is in central database means we allow the vehicle for filling fuel otherwise we receive silent alarm would the buzz which would indicate the operator at the fuel filling bunk that the vehicle is a stolen vehicle. For the identification of the vehicles, the information of the vehicles is already stored on the central database. So captured number will be sent to the server received at the Bunk.

Key Words: IFF, SVIS, SBML, Central Database

I. INTRODUCTION

The primary work is to find the theft vehicle inside the fuel filling bunk and the secondary task is automatic fuel filling and collect the cash via your integrated license card. Our ultimate aim is to reduce the queue and avoid the waiting time for consumers also identify the theft vehicle to inform very nearest police station. Our aim is reduce the consumer waiting time and provide automation inside the fuel filling bunks also provide consumer safety applications. In the past, customer would have to wait at the fuel filling bunk to pay the collector, creating traffic congestion, pollution and of course of a lot of frustration. Today intelligent fuel filling removes unnecessary traffic delays and provides more protection for your vehicles.

Here SBML Algorithm works very efficiently and this can depends on the below intelligent process,

1. FPI – Front Panel Identification

Front Panel Identification is the method to collect the photographic representation of front side view of the vehicle with the help of high definition cameras and identify the number plate location in that picture with the help of SBML Algorithm.

2. BPI – Back Panel Identification

Back Panel Identification is the method to collect the photographic representation of back side of the vehicle with the help of high definition cameras and identify the number plate location in that picture with the help of SBML Algorithm.

3. PMT – Panel Matching Technique

Panel Matching is very important because we match the text and numbers in Front Panel and Back Panel Identification Methods. If both are matched the vehicle is allowed for fuel filling.

4. VIS – Vehicle Identification System

This Vehicle Identification System search and analyze the database and produce the result either the vehicle database in central server or in police server. If the VIS result database the vehicle is in central server means the fuel filling process starts normally suppose the vehicle details in police database the fuel is not come also the silent siren blink inside the operator room.

5. LIS – License Identification System

This License Identification System is used to identify the owner figure print which is in the license card first we scan it once the process is completed then we start our current thump scanning of vehicle driver that time. If both are matched the amount will debit from the vehicle owner account directly.

6. MPS – Message Processing System

Message processing system provides some alerts to the vehicle owner and also informs the debited amount details. The benefits for the motorists include:

- Less or shorter queues at fuel filling bunks
- Faster and more efficient service (no exchanging fuel filling fees by hand);
- The ability to make payments by keeping a balance on the register account.
- The use of prepaid fuel filling statements (no need to request for receipts)

II. RELATED WORKS

“Number Plate Recognition for Use in Different Countries Using an Improved Segmentation” [6] in this paper focus was given on the segmentation algorithm that was based on tagging the pixel cluster and a region growing approach

Shan Du, Mahmoud Ibrahim, Mohamed Shehata, Wael Badawy [3] presents a comprehensive review of the state-of-the-art techniques for ALPR.

“Automatic Number Plate Recognition” [7]. In this paper two fastest algorithms Edge Finding Method and Window Filtering Method for the better development of the number plate detection system. A rare image of a vehicle is captured and processed using algorithms and detection of stolen vehicles performed.

Number plate extraction is done using a Sobel filter, morphological operations and connected component Analysis. Character segmentation is done by using connected component and vertical projection analysis. Character recognition is carried out using a Support Vector machine (SVM) [4].

ANPR system [8] is very much useful in applications like, automated traffic surveillance and tracking system, automated highway/parking toll collection systems, automation of petrol stations, travelling time monitoring. In this paper, introduction of number plate segmentation, feature extraction, recognition of character based on Neural Network and syntax checking analysis of recognized characters is described.

III. SYSTEM DESIGN

SBML – Smart Biometric based Matching Location Algorithm

A. System Architecture

The process starts when a sensor detects the presence of a vehicle and signals the system camera to record an image of the passing vehicle. The image is passed on to a computer where software running, on the computer extracts the license plate number from the image. License plate number can then be verified in a central database. If number valid for this system then License plate number recorded in a database with other information such as vehicle number, time, balance, personal details. License plate numbers can also be further processed and be used to control other systems such as raising a gate.

B. SBML Algorithm Structure

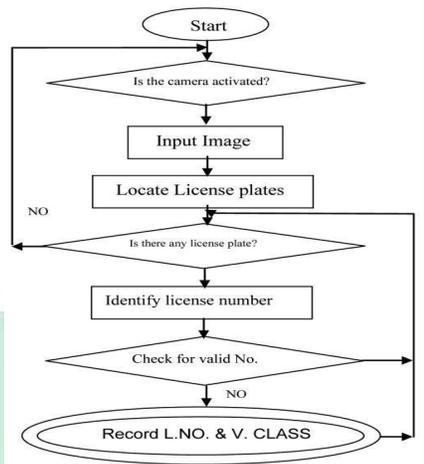


Fig 1 : SBML Algorithm Structure

The algorithm proposed in designed to recognize license plates of vehicles automatically. Input of the system is the image of a vehicle captured by a camera. The captured image taken from 4-5 meters away is processed through the license plate extractor with giving its output to segmentation part. The segmentation part separates the characters individually. And finally recognition part recognizes the characters giving the result as the plate number. For better performance of image to text conversion high resolution camera is required.

C. Problem Solving Methods

The Indian number plates following the new format can be off lengths 8, 9 or 10. Format of the registration is as shown below. AA 11 BB 1111 Where AA is the two letter state code; 11 is the two digit district code; 1111 is the unique license plate number and BB are the optional alphabets if the 9999 numbers are used up [1]. Using Validation and assumptions in string checking improves the accuracy of template matching. For example vehicle number is “OR 11 XX 1111”.If O matches with 0 (zero) but in predefined format first two field fixed for the character. Hence zero replace by O, similarly for B and 8, 2 and Z.

IV. SOFTWARE AND SECURITY

A. Login with OTP (one time password) security:

In proposed system as toll operator point of view provide OTP system. OTP is a password that is valid for only one login session. OTP generation algorithms typically make use of randomness. Any toll workers knows ID and password but when enter the private details for login then generate OTP and send to the toll operator register mobile and then login with OTP, ID and password. If all the details match then operator can login to the toll system.

B. Toll operating software:

When vehicle enter in the toll plaza then toll software automatically start. Shows in fig 4 in these application firstly get vehicle license plate number then check if number is valid for these system then using TTV(text to voice) read number in a speaker for driver confirmation. Also check the balance in customer account and same time check license number in stolen vehicle database.

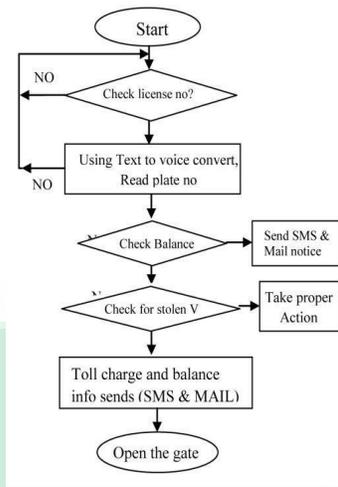


Fig 2 : Gate Opening Algorithm

In this research, Database plays a very important role. Database of new toll system is divided into mainly three parts:

1. Database Admin
2. Centralized database
3. Integrated database.

The central database is the heart of the whole database system. Firstly admin database contains details of central database administrator. This central database will be managed by a central administrator. The customer has to be registered for this account to use this system. This account information is stored along with the RTO database. When the registered customer will pass through the specified fuel filling bunks they automatically toll-charge will deducted from customer's account. And Central database will update with this information at a same time. After charge applied to the vehicle, the customer will receive the information through SMS on his mobile using GSM modem. The customer can see all his monthly or yearly transactions on his email account. Integrated database connected to the central database of the system. Integrated database consist of Police database and RTO database. Police database contains all stolen vehicle records with their FIR number. This database will update automatically. RTO database includes all registered vehicles with details like vehicle owner, vehicle number, license number, account ID, account balance, current charges, etc. Get vehicle information from RTO at customer account registration time and when vehicles number plate is captured then that number will match with customer database and police database. If the number plate is valid and no stolen vehicle record is found then automatically charges deducted from customers account and notify him through SMS. All these records are maintained at corresponding fuel filling bunk and central. These records can be seen by account ID, Customers name or number of the vehicle. All fuel filling records stored at central server and these records could be seen and printed by day, date, month, and year.



Fig 3 : Gate Opening System

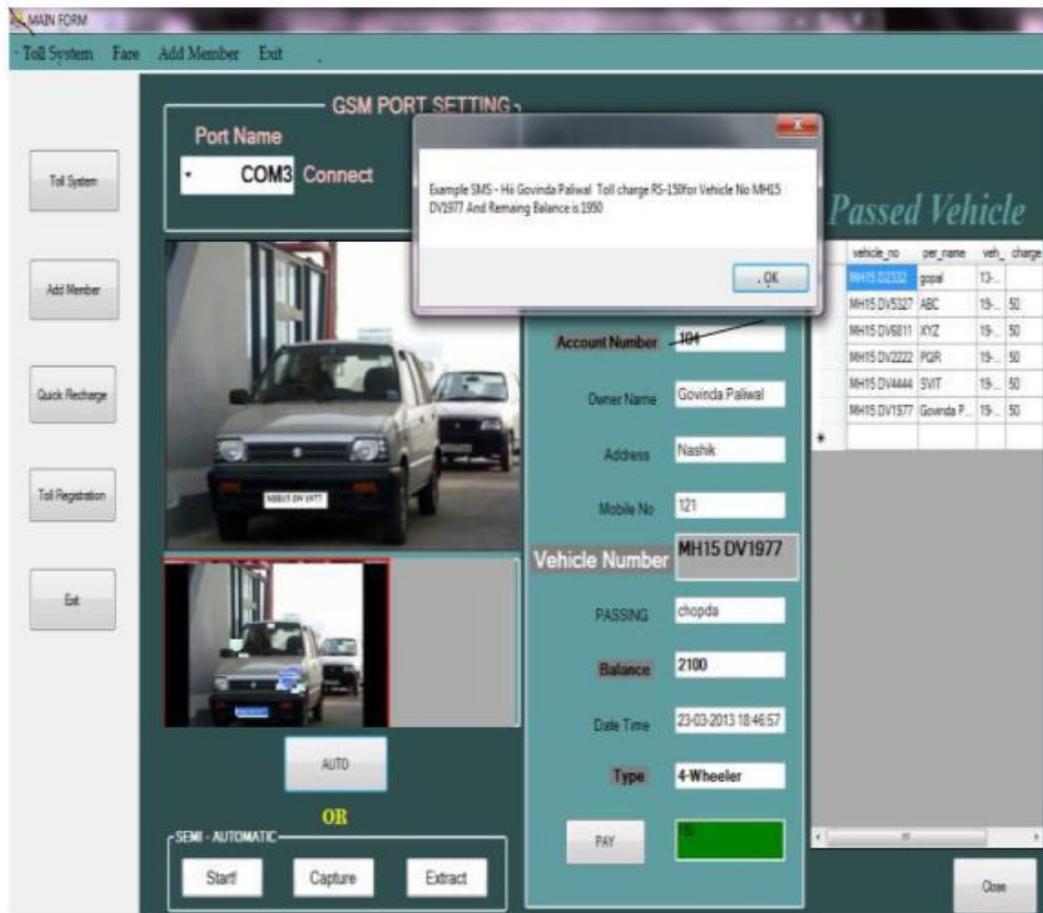


Fig 4 : SBML Dashboard with Database

V. CONCLUSION

Thus the system for SBML Algorithm for Intelligent fuel filling also avoids the vehicle theft. It can be used to remove all drawbacks with the current system such as time and human effort and it also doesn't require any tag only required best quality camera and fixed font number plate.

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