



# International Journal of Innovative Research in Computer and Communication Engineering

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## Intelligent Number Plate Recognition System for Avoiding Vehicle SCAMS

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**ABSTRACT:** Tollbooths in India generally employ a purely visual system of vehicle classification. However, this causes a huge loss of revenue to the firms operating the tollbooths due to rampant malpractices and discrepancies. The primary motto of this vehicle scam identification system is to avoid vehicle scams occurred over road networks such as using invalid number plates for crime scenarios and got escaping from surveillance. Along with this system enables intelligent Gateway based Alert mechanism is used for immediate alerts on time without any delay and provides complete failure free monitoring scheme at anytime and anywhere. In the proposed approach, License Plate recognition is used, which is one of the techniques used for vehicle identification purposes. The sole intention of this project is to find the most efficient way to recognize the registration information from the digital frames captured from camera. The license number plate monitoring system comprises of three different modes to follow, those details are summarized as below: (i) License plate localization, (ii) Segmentation of the characters and (iii) Recognition of the characters from the license plate. Once recognized the surveillance system analyzes the result and produce the proper summary regarding the object. So that we can easily identify the vehicle is proper or not. For all the entire system is helpful to maintain the road network scenarios with high level of integrity and support.

**KEYWORDS:** Number Plate Scanning, Verification, Integrity Checking, Cam Based Surveillance, Gateway Alert System.

### I. INTRODUCTION

Intelligent vehicle verification is broadly utilized as a part of traffic rules requirement frameworks. High Focusing cameras as a critical piece of most verification proof frameworks have high cost and depend on clear optical conditions to empower the tag perusing. An elective approach for vehicle verification is expected to exploit Smartcard scanning System under control of RFID Classes.

Radio verification proof system has basically lower cost and is more solid as far as climate conditions. At the same time RFID can read the labels everywhere enough separation to make the vehicle radio recognizable proof doable. RFID framework comprises of a Reader, or an Interrogator, and Labels. Such frameworks can be dynamic, if the tag has an inward control source and can autonomously start message sharing with the purchaser or inactive generally. Latent RFID for the most part gives less perusing separation as the flag needs to pass twofold separation from the purchaser to the tag and back and exhibits huge constriction along this way, yet such labels are altogether less expensive than the dynamic ones and are energy independent. Before executing the framework, all things considered, a proof-of concept examination ought to be completed. So as to appear suitability of the framework and to contemplate its execution the pilot venture was propelled in Kazan city in 2014.

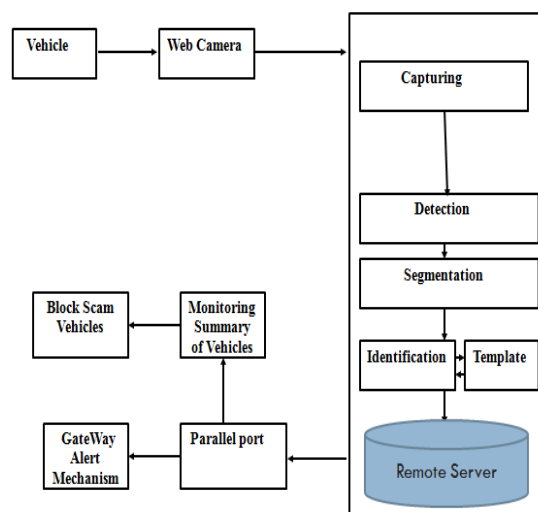
Four verification proof focuses were conveyed and close 1000 transports were outfitted with labels set both onto permit plates and under the windshields. As per the examination conditions, the transport was distinguished if any one label mounted on it was effectively perused. The proposed system integrates the web camera along with the RFID mechanism to provide cost efficient and intelligent vehicle monitoring and verification system.

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**Fig.1 Proposed System Architecture Diagram**

In the section II., Literature Survey can explained in detailed manner as per the year basis. In the section III., various kinds of Implementation are discussed as level by level. In the section IV., Consolidated results are given. In the section V., Conclusion and proposed Enhancement also be listed as follows.

## II. LITERATURE SURVEY

In the year of 2011, the authors "A. A. Khan et al" proposed a paper titled "Radio frequency identification (RFID) based toll collection system", in that they described such as: an efficient utilization of communication link between RF Modems over a wireless channel to facilitate vehicle monitoring, vehicle authentication and automated toll collection on the highways is proposed. The system is implemented to automatically register vehicles getting on or off a motorway or highway, cutting the amount of time for paying toll in large queues. The detailed monthly bills will be sent to the customer at the end of the month. The customers could register and get a transmitter module and thereafter would not need to stop at toll booth whenever they get on or off the motorway. The implementation is divided into the design of two modules- the Vehicle Module (Active Tag) and the Base Module. The two modules communicate via RF modem connected to each module. These RF modules communicate over the ISM Frequency Range of 902-928 MHz., The Vehicle module revolves around Atmel 8051 microcontroller. This module contains an LCD panel (16×2), keypad (4×3) and an RF modem interfaced to the microcontroller through Max-232 chip. Microcontroller contains user-specific data associated with vehicle, such as the Registration Number, Engine Number and owner's information along with the billing address. The base module comes with a user-interface that allows the administrator to monitor the current activities in the range, including the vehicles in range, their status, and the detailed information about any registered vehicle. Moreover both, base and vehicle module can communicate with each other through chat session.

In the year of 2013, the authors "S. R. M. Gonzalez et al" proposed a paper titled "Passive UHF RFID Technology Applied to Automatic Vehicle Identification: Antennas, Propagation Models and Some Problems Relative to Electromagnetic Compatibility", in that they described such as: propagation channel aspects in current passive UHF RFID systems applied for automatic vehicular identification (AVI) are presented, considering the antennas design for passive UHF RFID tag and some problems relative to the electromagnetic compatibility. These issues are focused on RFID link, reader-tag-reader, and the channel modelling that is supported with measurements, and reader-reader interference problems are analyzed.

In the year of 2016, the authors "L. Azpilicueta, et al" proposed a paper titled "Intelligent Vehicle Communication: Deterministic Propagation Prediction in Transportation Systems", in that they described such as: Intelligent transportation systems (ITSs) are currently under intense research and development for making



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transportation safer and more efficient. The development of such vehicular communication systems requires accurate models for the propagation channel. A key characteristic of these channels is their temporal variability and inherent time-changing statistics, which have a major impact on electromagnetic propagation prediction.

### III. EASE OF USE

The number plate monitoring and verification system is implemented based on several strategies, those strategies are coming under derivation by means of four different modules such as authorization, scanning, verification, alert system and so on, which are summarized in detail manner below:

#### A. Vehicle Pattern Authorization

The Vehicle Pattern Authorization module allows the user to register the details regarding the vehicles such as: Owner name, identification as image, Registration Number, RFID smart card details and so on. This module is helpful to maintain the details of vehicles around the region. So, that it is really useful to trap the vehicle while scanning with camera.

#### B. Authority Registration and Scam Vehicle Block Port

The Authority Registration module allows the respective individual who is taking care about the maintenance of toll booth and other emergency checking areas. This module requires the name and designation of the individual with proper contact number. The alerting scheme passes the Short Messages (SMS) to the mentioned number of the authority. As well the Scam Vehicle Block Port allows the authority to block the vehicles which is marked as scam and this kind of blocking permits the authority to block the vehicles all over the toll regions, not in the particular place.

#### C. Number Plate Scanning Port

The Number Plate Scanning Port module is helpful in the toll booth scenarios, whenever the respective vehicle crosses the toll booth entrance the scanning port immediately trace the vehicle's registration number from number plate by using Number Plate Classifier Algorithm (NCPA). The extracted number is cross checked with two criteria's, such as: match it with the registered vehicle status and blocked scam vehicle status. If the resultant of these scanning will be triggered as possible, then only the system allows the vehicle to proceed further, otherwise the vehicle is blocked in the respective place by authorities.

#### D. GateWay Alert Mechanism

The Gateway Alert Mechanism module is useful for raising alert via Short Messages (SMS). The gateway alert mechanism is basically operated via classification logic, once the number plate details are extracted, which is crosschecked with the registration server, those details are not matched or any blockings found, the gateway immediately triggers the SMS to the respective authority without any delay.

#### Past System Analysis

The high performance fibre optic sensors are used for detection of moving vehicles. A typical installation consists of an interface device with transmitter, receiver, and light guide connection cable and Infrared (IR) sensor. An IR Sensor basically consists of an infra-red transmitter and receiver. So, it is positioned in the vehicle. Once the vehicle crosses the scanners the IR strip gives readings, through that readings the vehicle details are gathered. However, the entire profile of the vehicle cannot be obtained by using just one strip of IR due to varying speed of the vehicle that passes the gate. No accurate scanners are there and even if the speed of the vehicle increases immediately the scanner give noise readings, so it is not proper at any case.

The past system implementation has several disadvantages, some of them are listed below:

- (a) IR based scanners are used, which is costly and not accurate.
- (b) Scanners are activated based on vehicle speed, so noise resulting in more cases.
- (c) Entire vehicle details is not possible to store within a strip of IR.

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(d) Inefficient process and poor in performance.

## IV. PROPOSED SYSTEM SUMMARY

The proposed work is designed based on Portable License Plate Recognition technique using Number Plate Classifier Algorithm [NPCA]. With this system we can use our regular web camera for entire processing and the result is 99% accurate with all scenarios and all state number plates. Alerts will be passed via Gateway units, so there is no mean for failures at any case. There is no option for vehicles to pass away the tolls without registration scheme and proper details of vehicles. Simple to use with portable nature, so anywhere we can easily adopt the system without any special trainings and support. Summary of vehicles can easily be monitored at any circumstances. The proposed system implementation has several advantages, some of them are listed below:

- (a) Portable and Cost-Effective design nature.
- (b) Accuracy level is best in nature.
- (c) Best in performance and scanning results.
- (d) User-Friendly nature and Quick response medium.

## IV. EXPERIMENTAL RESULTS

The following figure illustrates the authentication window of the proposed system.



Fig.2 Authentication Window



Fig.3 Main Page

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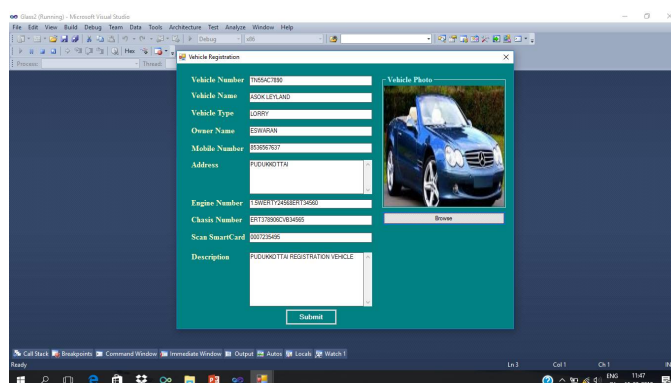
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The screenshot shows a web form titled "Authority Registration" with a teal background. It contains four input fields: "Authority Name" with the value "SYED IBRAHIM", "Mobile Number" with "8248588616", "E-Mail-ID" with "syed.ibrahim@gmail.com", and "Designation" with "CEO". Below the fields is a red "Update" button.

Fig.4 Authority Registration



The screenshot shows a web form titled "Vehicle Registration" with a teal background. It contains several input fields: "Vehicle Number" (TMSAC7892), "Vehicle Name" (ASOKLETLAND), "Vehicle Type" (LORRY), "Owner Name" (EDWARDAN), "Mobile Number" (80366767), "Address" (PUDUKOTTAI), "Engine Number" (E50181024503110560), "Chassis Number" (S1717800CVB4395), "Scan SmartCard" (0022048), and "Description" (PUDUKOTTAI REGISTRATION VEHICLE). There is a "Vehicle Photo" section with a photo of a blue car and a "Submit" button at the bottom.

Fig.5 vehicle Registration

## V. CONCLUSION

The objective of this system is to resolve algorithmic and mathematical aspects of the automatic number plate recognition systems, such as problematic of machine vision, pattern recognition, Object Character Recognition(OCR) and neural networks. The problematic has been divided into several chapters, according to a logical sequence of the individual recognition steps. Even though there is a strong succession of algorithms applied during the recognition process, chapters can be studied independently. Automatic Number Plate Recognition solution has been tested on dynamic nature of vehicles, which has been divided into several sets according to difficulty.

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