AUTOMATED NUMBER PLATE DETECTION AND COLLECTION ON TOLL PLAZA USING IMAGE PROCESSING

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Abstract—Now a days there is a large amount of rush in the toll plazas in order to pay the toll tax.. Therefore in order to reduce the traffic jam and to save time, & also to reduce the money loss. I have designed project for the automation in toll tax payment using E-wallet system. This report explains the implantation of automation in toll plaza which is detecting the number plate, debit the money from the owner account automatically and find the stolen vehicle. This translates to reduced Traffic congestion at toll plazas and helps in lower fuel consumption. Toll Collection is a matter of concern as the toll checkpoints are chances of corruption. Using this technique I can make an attempt to eradicate corruption from toll checkpoints in India

Keywords—E-wallet, Toll collection, SMS Gateway, Toll Deduction, *Stolen* vehicle detection

I. INTRODUCTION

In our country there is number corruption is occurred such in government sector, I personally attention in toll plaza, in toll plaza there is so many problem facing the toll plaza controller and people.

The toll plaza the controller closed the gate when vehicle entered in toll plaza then he register the vehicle number and charges of that vehicle. Sometime the controller does not enter the data manually and does not send the proper data to the government.

The purpose of the project to overcome some issue in toll plaza such as toll collection, traffic congestion, time consuming and fuel consumption. In proposed system, it detects the number plate on the vehicle and deducts the charges of that vehicle automatically and also find stolen vehicle.

In this system the vehicle is passing through the toll plaza it detect the number plate and deduct the toll tax. The system consists of four modules such as super admin module, toll admin module, police admin module, rto admin module and general people.

The system is automatic toll collection electronically by image processing. The system it deduct the money using E-wallet concept. The vehicle number plate either image format or video in the database with the help of either video or image with the help of those images the image processing technique will be implemented to extract the registration number of the car from the number plate, with the help of this extraction the details of the vehicles owner will be extracted from the database and the respective amount will be deducted, if the vehicle owner acquires a debit card and credit card, even that information will be extracted from the database because that person has already paid the toll amount in advance for a respective duration and the toll amount won't be collected from him/her. In order to overcome the major issues of vehicle congestion and time consumption, the e-wallet system is used.

In the proposed system video will be passed as an input or can be browsed from any location. Using this video the number plate is detected and further process continues. Various modules of this system are RTO admin, Toll admin, Police admin, Super admin and the general public. The role of the Super admin is to register toll centers at various locations using User name and password. Toll deduction takes place through e-wallet assigned to the concerned number plate of the vehicle that belongs to the owners' account.

The main motivation of this system is to provide a base for implementing automatic number plate detection using image processing for toll collection at toll checkpoints. This system will help in

saving time as well as help in reducing congestion at toll plaza. This system will also help in monitoring any fraudulent behavior that takes place at the toll plaza. The proposed system will take an image placed at the toll checkpoint and will perform certain processes to detect the number plate of a vehicle. In this system video will be passed as an input or can be browsed from any location. Using this video the number plate is detected and further process continues.

II. PROBLEM IN EXISTING SYSTEM

2.1 Corruption in toll plaza center:

In toll plaza corruption is increase because when the people pay the toll. This module store the all information regarding all toll centers located in our country. This module also provides the charges of the vehicle according to the toll centers. And store all information such as collection of money, number of vehicle pass through the toll plaza and so on. Tax the toll controller enters the all information when paying the tax manually and send the report to the government. Some toll plaza the controller does not fill the data properly and send the faulty or corrupted result to the government.

2.2 Increase stolen vehicle rate:

In our country, stolen vehicle rate is increase police department does not find the stolen vehicle easily and more time is taken for find the stolen vehicle.

2.3 Time consuming:

In the existing system, toll plaza center fill the data manually. All people are stop in toll plaza and pay the toll tax by hand or by using the debit card. There is more time is taken for the procedure of toll plaza.

2.4 Wastage of paper and fuel:

The previous system is manual system and the payment of tax was the manual process hence a user always had to carry the cash or the credit cards for the payment of the tax. The vehicle got congested in queues and waiting for the toll tax payment in that case many more users not turn off the vehicle by this the fuel got waste.

III. LITERATURE SURVEY

3.1 License plate recognition:

License plate recognition (LPR) is a type of technology, mainly software that enables computer systems to read automatically the registration number (license number) of vehicles from digital pictures.

3.2 Fraud Detection in Road Toll Systems using Apache Storm:

In this paper how the stolen vehicle is detected on toll road.

3.3 Automating the Payment of Toll Tax at Toll Plazas:

In this paper the system will be an automated model which will give a guarantee on collected funds will have some transparency. As the system is developed with the help of some high end applications which provides easy and fast processing.

IV. MODULE IN PROPOSED SYSTEM

The proposed system work on the five module such as super admin module, toll admin module, police admin module, RTO admin module and the general people. They work given bellow.

4.1 Super admin module:

This module store the all information regarding all toll centers located in our country. This module also provides the charges of the vehicle according to the toll centers. And store all information such as collection of money, number of vehicle pass through the toll plaza and so on.

4.2   Police admin module:

This section stores the information regarding to the stolen vehicle. When vehicle is stolen the owner writes the FIR to the police station.

4.3   RTO admin module:

The RTO admin store all information owner vehicles such as name of the owner, address, mobile number, account number, email and so on.

4.4   Toll admin module:

This section generates the report how many vehicles passing through the toll plaza and detecting the number plate and deduct the toll tax through electronically using e-wallet concept.

4.5   People module:

In people section when vehicle passing through the toll plaza the amount is deduct the automatically. The people has own account and recharge the own account when the e-wallet money is finished.

V. WORKING IN PROPOSED SYSTEM

The working of the system is firstly vehicle is passing through the toll plaza the camera take the image or the video store in to the database. When vehicle passing from the toll plaza the camera detect the number plate as in the form of video or the image and check the number plate to the RTO database then deduct the money from the owner account. When amount is the deducted then it send the SMS to the owner mobile how much toll tax is deducted. At the time of the number plate detection the vehicle number plate also check to the police database. If the vehicle number is found stolen it also send the message to the police and the owner with the name of toll plaza.

The proposed system it used the concept of e-wallet system. The e-wallet is just like an electronically digitalized amount is deducted from the user account. It connected with the user bank account when user provides key number the amount then automatically deducted.

VI. FLOW OF THE SYSTEM
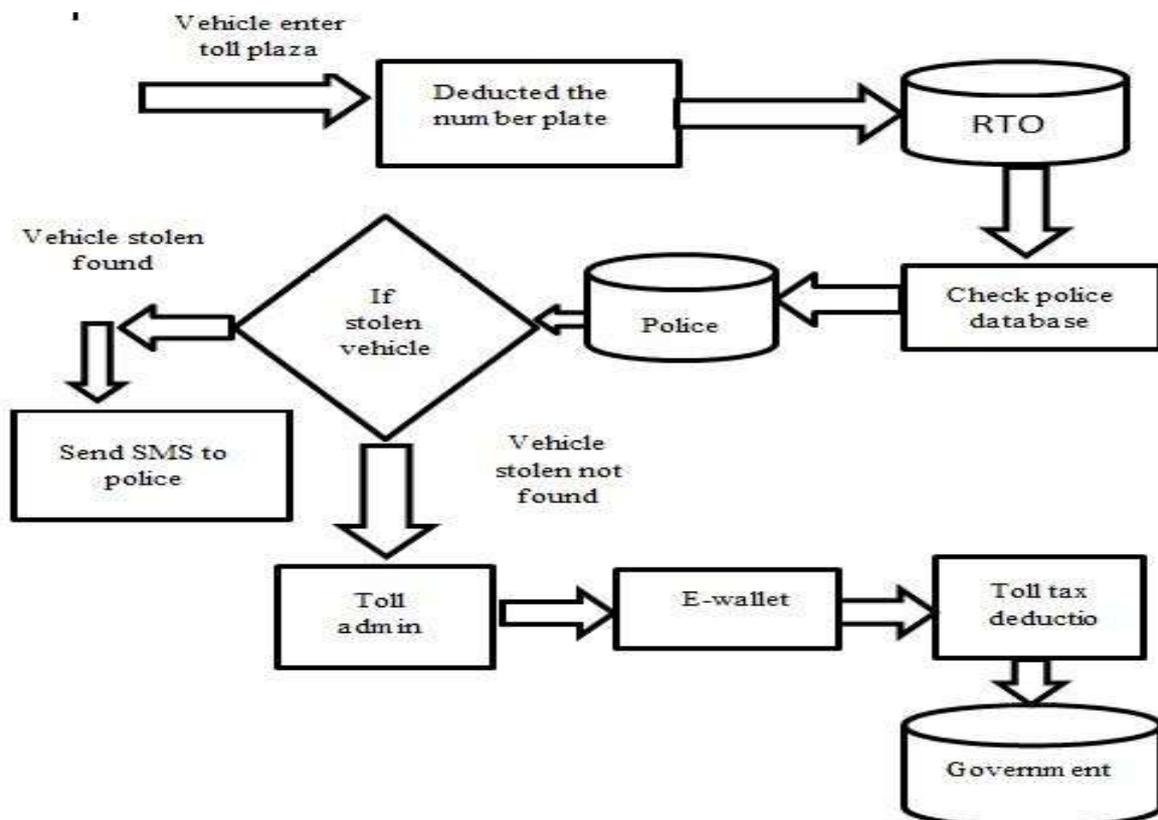
VII. METHODOLOGY

Template matching Algorithm:

Template matching is a method in digital image processing for finding small parts of an image which match a template image. Template matching is the process of decide the presence and the location of a hint image or an object inside a scene image under analysis by a structural cross-correlation. Typical cross-correlation type algorithms are computationally costly. Furthermore, when the object in the image is revolving, the typical algorithms cannot be used for practical purposes. An algorithm for a revolution-constant template matching with sub pixel accuracy is expected based on the sequence of the correlation and Fourier-Mellin transformation when the vary scope of the revolution angle is [−20deg, 20deg]. The algorithm consists of two stages. 1) The matching candidates are selected using a computationally low-cost improved correlation algorithm. The operation of AND is adopted to reduce the computational cost for this stage. 2) Rotation invariant template matching is performed only on the matching candidates using the cross-correlation algorithm after adjusting image with a Fourier-Mellin invariant (FMI) descriptor, and the matching precision is sub pixel by the different method using the Fermat point. Experimental results show that the proposed method is very robust to Gaussian noise and rotation, and it also achieves high matching accuracy and matching precision.

VIII. CONCLUSION

Thus a system used as an Automated Toll collection plaza, based on image processing saves the time at toll plaza, minimizes the fuel consumption during the ideal condition of the vehicle. In turn we can save the environment from radiation of extra carbon monoxide (co2). Hence we can save our country. Also it serves in providing the tracking system for theft vehicle which is secured and highly reliable can be obtained. 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 on each vehicle.

REFERENCES

[1] License plate recognition available on http://www.licenseplaterecognition.com
[2] Shikha Agrawal and Pratik Khairnar "Fraud Detection in Road Toll Systems using Apache Storm" IJSART Volume 2 Issue 12 , pp. 39-41, DECEMBER 2016.
[3] Amol Joglekar and Kruti Sanghvi" Automating the Payment of Toll Tax at Toll Plazas", Volume 6,Issue 3,2015,pp.2884-2887.
[4] Ms.Kirti A.Lonkar and Ms. Pratibha P. Kulkarni ," Automated Toll Collection Using Satellite Navigation", IJCER Volume 4,Issue 4, ,pp.14-16,April 2014.
[5] Priyanka and Punitha," Automation of Tollgate and Vehicle Tracking System", IJSR Volume 4 Issue 7,PP.1782-1785, July 2015.
[6] Bahubali Akiwate and Manjunath Suryavanshi," Automated Toll Collection", IJARCSSE Volume 5 Issue 10, , PP.276-280n October-2015.
[7] Ankita Bhore,Priya Thombre, Punam Pure,Bawana Nimbhorkar,Prof. Gunjan Agre, "Automated toll system for number plate detection and collection" ,IJARCCE Vol. 5, Issue 9,ISSN 2278-1021, October 2016.
[8] Ankita Bhore,Prof.Gunajan Agre, "The Survey on automated toll system for number plate detection and collection", IJIRCCE vol.5, Issue 1,pp 305-310, January 2017.
[9] Punam Pure "A survey on the toll system using E-wallet and SMS gateway", IJIRCCE vol.5, Issue 1,pp 305-310, January 2017.