Vehicle Tracking using Number Plate Recognization and Drunk and Drive Detection System

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Abstract- License plate location is an important phase in vehicle license plate recognition for intelligent transport systems. This paper presents a robust and real time method of license plate location. License plate recognition has been widely studied,and the advantage of image capture technology helps to enhance or create new methods to achieve this objective.Due to the rapid growth of highways and the extensive use of vehicles, researchers launch more interest on proficient and accurate intelligent transportation systems. In such circumstances, it is difficult for identification of the vehicle number plate. The above mentioned challenge is highlighted in Automatic Number Plate Recognition of vehicle. For this, the concept of Optical Character Recognition is used. This work presents a strong technique for localization, segmentation and recognition of the characters within the located plate.In this work, a method for real time detection and segmentation of car license plate based on image analyzing processing techniques is presented.Here the optical character recognition algorithm (OCR) is used to recognize the individual character with the help of database stored for each and every alphanumeric character. After recognizing the license plate, the respective vehicle owner's details will be retrieved from the database. And these details can be used for checking whether the vehicle is licensed or registered.

I. INTRODUCTION

Automatic vehicle license plate recognition system plays a major role in real life such as in toll gates collection, parking lot accessing management, and road traffic monitoring. This system recognizes a vehicle's number plate in the form of an image by digital web camera. It is fulfilled by the combination of a lot of techniques suchas image acquisition (capturing the image of real image of plate localizing the license plate character),segmentation (locating and identify individual character on the plate)and optical character recognition(OCR algorithm).Now a day's, recognition or identifying the information present on the moving objects is turning of great importance. The increasing human dwelling and the growth of industry arena in the current scenario has made vehicle a mandatory need which in turn leads into a serious traffic issues.

The number of accidents in the world is increasing day by day and among these accidents, more than 60% are caused due to menace of driving under the influence of "unreasonable" alcohol consumption. Therefore, since the death due to drunken-driving has assumed proportion larger than one can imagine, it requires immediate attention. This paper attempts to explore the possibility of using the technology that would detect the level of alcohol in the blood and prevent "very-start" of the motor vehicle. The model device aims at preventing the user from driving when drunk and reduces the number of accidents occurring due to drunken driving. The model is created using Arduino Uno and Alcohol detecting sensor. The alcohol detecting sensor (MQ-3) when connected to a Raspberrypi detects the level of alcohol content in blood by analysing driver's breath. The MQ-3 alcohol sensor isembedded (placed) atthe middle of the steering wheel (Internet of things) so that whenever the driver exhales the sensor measures the alcohol level, analyses whether it is within the "safe" limit or not,before allowing the ignition of the "motor-engine". The "stipulated" legal limit of alcohol level in India is 0.03%, which means 30 microliters of alcohol in 100 milliliters of blood. Needless, to say as and when the excess-alcohol content gets detected it sets up alarm or buzzer. The placing of the alcohol-sensor at the centre of the steering wheel ensures that the detection of alcohol-content is limited to the driver's seat and does not take into the account the alcohol content in the blood of the fellow-passengers. The paper attempts to produce the design and operation of the "model-device"that when produced commercially can help save precious life lost to reckless driving under the influence of alcohol.

II. EXISTING SYSTEM

Vehicles plays a most important role in our life.But there are many problems in vehicle driving such as accidents due to drunk and drive ,over speed, theft of vehicles .There are breath anaylysers which are very costly .There are adequate number of applications and software available in the market to identify or recognize the registration number plates. These systems serve the purpose with few limitations. To cite a few: these applications consume ample amount of time for the recognition also they require image with high quality. The existing ANPR methods works well for dark and light/bright images but it does not work well for low contrast, blurred and noisy images.

III. PROPOSED SYSTEM

In this proposed system, we recognize the vehicle number plate through the cameras, CCTV's which will be converted from RGB image to Optical Character Recognition (OCR). This proposed system works fine for low contrast, blurred images as well as dark and light/bright images. An alcohol sensor is placed in the steering, and if the alcohol has been consumed by the driver, then automatically the sensor detects

it and sends the notification to the nearby toll or police station so that the drunken driver can be stopped from driving the vehicle.. If not, then notification will automatically be send to the toll or police station along with the location using gpsmodule.

IV. IMPLEMENTATION

Three Raspberry-pis are used.

RASPBERRYPI1: Placed in a car. In this raspberrypi, Alcohol sensor (Mq3 sensor) is connected. Gps module is also connected to same raspberrypi. Email will be sent to system when alcohol is detected along withgps location.

RASPBERRYPI2 and RASPBERRYPI3

Will be placed at Traffic lights. Cameras are connected.Cameras get activated when alcohol is detected and gps of car and gps of cameras are equal.Cameras capture image of number plate and number is extracted through OCR model.

MAIN APPLICATION

It is done with Tkinter(Python module for GUI).Numbers extracted from raspberrypi 2 and raspberry pi 3 are stored in database along with camera nos and time. Gps location of car is received from raspberrypi1. When vehicle number is entered, Path of the vehicle is detected bycomparing numbers in database. And Location of car with google map is displayed. Communication is done through Socket programming.

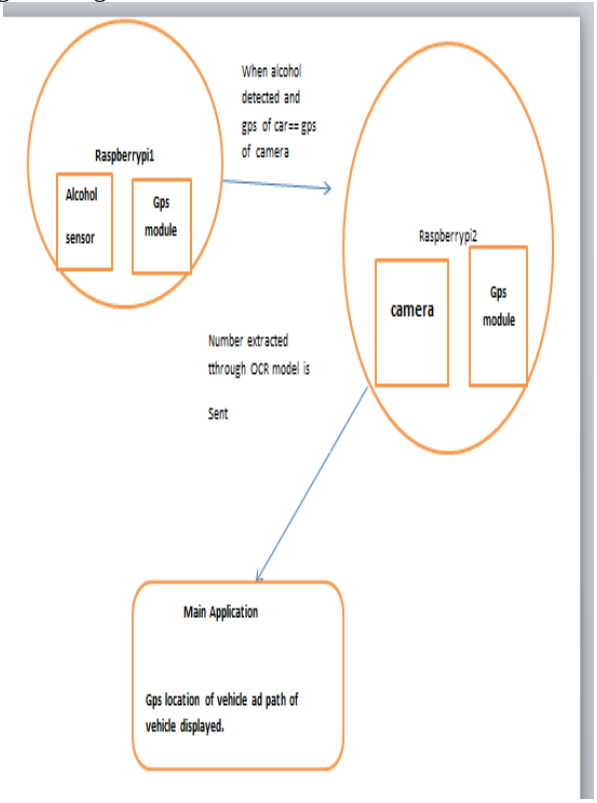

Fig.1: working of 3 Raspberry pi's

Alcohol Detection

Connection between MQ-2 and Raspberry Pi

In this example, we use a 5V voltage as output. This is too much for the GPIOs, which is why we use a logic level converter (TTL) that cuts down the voltage. If you use a sensor other than the MQ-2 and it has a different voltage, the setup must of course be adjusted.After the MCP3008 is correctly connected, we use port 0 and connect it to RX0 of the TTL. On the opposite side is RX1, which is connected to the analog pin (A0) of the MQ2 sensor. Also connect 3.3V from the Raspberry Pi (LV) and 5V (HV) to the TTL. And also 5V to the VCC pin of the gas sensor and GND from the Raspberry Pi comes to GND on the LV and HV side of the TTL, as well as to GND of the MQ2.

Configuration of the Raspberry Pi Gas Sensor – Preparation

The concentration of a gas is given in PPM (parts per million). One difficulty of the MQ-2 is that a single analog value is given with which the gas content in the air has to be calculated for the various supported gases. However, the sensor must be configured for this purpose. Since this manual is also applicable to another Raspberry Pi gas sensor, the procedure is as follows:

First, we have to see the data sheet of the respective module, which contains a diagram:

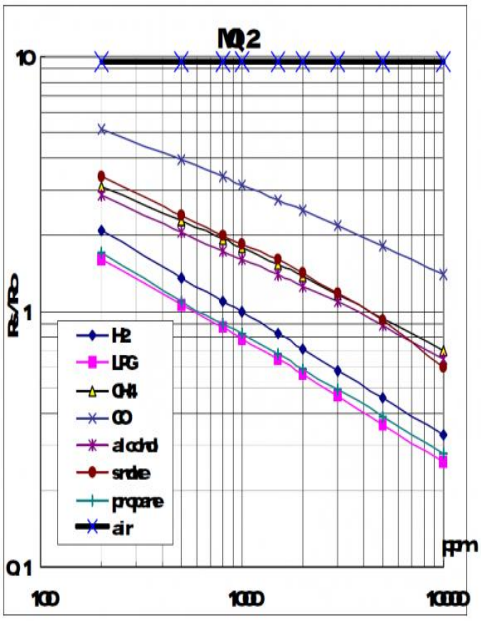

Fig.2: The specified values are in logarithmic scale.

However, the scaling of the values is not linear but logarithmic to the base 10 (log). so, the first stroke on the X axis is 200, then 300, etc. The first stroke after 1000 is 2000, etc. The distance between is linear. The idea behind this script for calibration and reading is to create a straight line and calculate the amount of gas (in ppm). To do this, we need two points to calculate the slope.

Let us take the example of LPG. We therefore take the point P1 (x = 200, y = ~ 1.62) and P2 (x = 10000, y = ~ 0.26). To calculate the "real" values, we apply the ten logarithm. Using

the two-point form, we can calculate the slope, which in our case is -0.47 (link to the calculation). With the slope and the calculated logarithm from the left point (x = 2.3, y = 0.21), we can now determine the straight line.

V. RESULTS

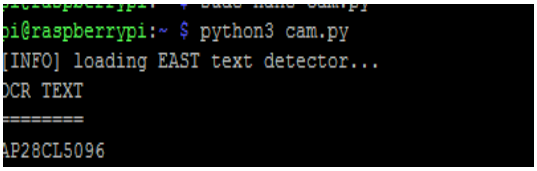

Fig.3: Number Extraction Using OCR Model

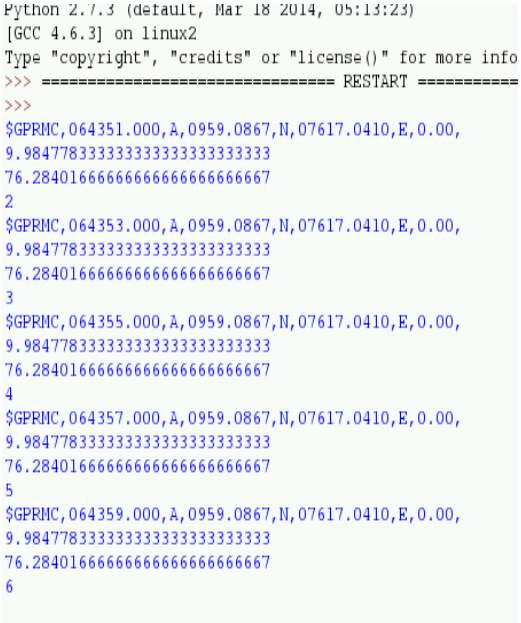

Fig.4: Display GPS Coordinates

Fig.5: Vehicle tracking using number plate Recognition system home page

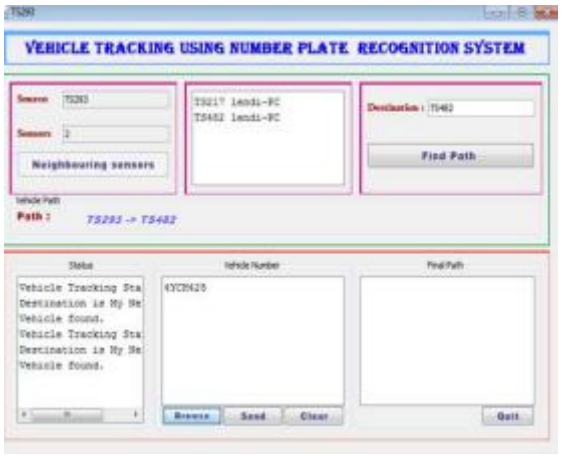

Fig.6: Vehicle number and status

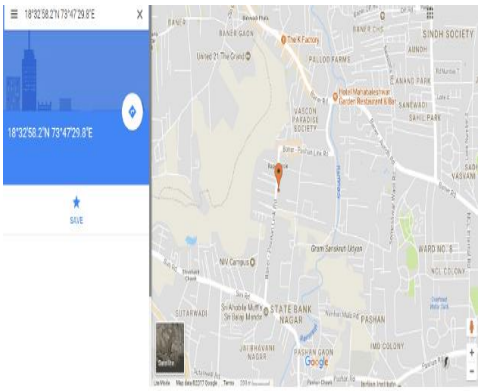

Fig.7: Vehicle location

IV. CONCLUSION

In this paper, an industrial, robust and reliable ANPR system for high speed applications is proposed. The main advantage of our system is its high detection and recognition accuracies on dirty plates. We have tested this system on a publicly available English plate data set as well and achieved an overall accuracy of 97%. The proposed system is compared to many reported ANPR systems from different point of views.. These systems have been tested day and night over a year and presented robust and reliable performances, in different weather conditions, such as rainy, snowy, and dusty. The character recognition part of our system has been tested separately over the data set and achieved 98.5% accuracy, with comparably low computational requirement. It is guaranteed to be around 96% for the extraction of plate region, 95% for the separation optical characters recognition,and hence this gives the overall system performance better than the existing system. The recognition time is between 5 to 15 seconds which is relatively shorter than current time i.e. more than 30 sec.The main objective of this paper is to produce better results in vehicle tracking by gps module to prevent accidents due to Drunk and drive.

V. REFERENCES

[1]. S.-L. Chang; L.-S. Chen; Y.-C. Chung; S.-W. Chen, Automatic License Plate Recognition, IEEE Transactions on Intelligent Transportation Systems 5, no. 1, 42–53.J.R. Parker and P. Federl, an Approach To License Plate Recognition, University of Calgary.

[2]. Lee, E. R., Earn, P. K., and Kim, H. J., "Automatic recognition of a car license plate using color image processing", IEEE International Conference on Image Processing, vol. 2, pp.301-305.

[3]. G.C.Lekhana and R.Srikantaswamy," Real time license plate recognition system," International Journal of Advanced Technology & Engineering Research, Vol-2, Issue-4, pp 5-9, July 2012.S Kranti and K Pranathi," Automatic number plate recognition," International Journal of Advancements in Technology,vol-2, no-3, pp408-423, July 2011.

[4]. C. Chunyu, W. Fucheng, C. Baozhi and Z. Chen," Application of image processing to the vehicle license plate recognition," International Conference on Computer Science and Electronics Engineering, published by Allantis press, pp 2867-2869, 2013.

[5]. Xin Fan, Member, IEEE, and Guoliang Fan, Senior Member, IEEE, "Graphical Models for Joint Segmentation and Recognition of Number Plate Characters", IEEE SIGNAL PROCESSING LETTERS, VOL. 16, NO. 1, JANUARY 2009.

[6]. Shyang-Lih Chang, Li-Shien Chen, Yun-Chung Chung, and Sei-Wan Chen, Senior Member, IEEE, "Automatic Number Plate Recognition", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 5, NO. 1,pp. 42-53.

[7]. PriyankaPrabhakar, AnupamaP, Resmi S R, -"Automatic Vehicle Number Plate Detection and Recognition".International Conference on Control, Instrumentation, Communication and Computational Technologies (ICCICCT)-1-4799-4190-2/14/$31.00 ©2014

[8]. Abbas M. Al-Ghaili, SyamsiahMashohor, Abdul RahmanRamli, and AlyaniIsmail, "Vertical-Edge-Based Car LicensePlate Detection Method.", IEEE Transactions on Vehicular Technology vol. 62, no. 1, Jan 2013.

[9]. Avadhut S Joshi, Digambar A Kulkarni"Automatic Number Plate Recognition and IoT Based Vehicle Tracking"- Volume: 04 Issue: 07 | July -2017. [10]Prof.R.M.Sahu,NamrataB.GaikwadChandrakantB.Sandage, VikramS.Shinde on "IoT Based Automatic Vehicle License P.