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DRIVER ASSISTANCE SYSTEM USING IMAGE PROCESSING AND DEEP LEARNING ALGORITHM

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Abstract: Road image analysis is an important step towards using computer vision to build automated driver guidance system. Due to driver negligence and non-ideal road conditions, several road accidents and mishaps are reported each year, like not paying / neglecting towards the RTO symbols. There is little research toward the direction of Indian road image analysis. This project aims to present an intelligent device for detecting RTO symbols on highway, cities using camera with the aid of raspberry pie circuit mounted in vehicle, which also shows the symbols as a warning on the dashboard of the vehicle. The machine can check the side of the road to identify traffic signals. We will identify the sings after detecting Traffic Signs which will support Auto Driving Program which lead to enhancing Automated Cars' function. The framework created user-friendly integrated design interface to prevent eye-to - eye driver / dashboard users. To improve the idea of driver man auto powered vehicle, the framework can be introduced. Automated vehicles required vision assistance and this will be how our program operates. Camera will work as a car's eye and our model will work as an automated car's brain and help drivesafely.

Keywords: percentage of eye closure, driver fatigue, buses and heavy trucks etc.

I. INTRODUCTION

Road signs, traffic signals, and other traffic devices are used to guide, warn, track, or inform road users. We help preserve a fair degree of productivity of road traffic and improve safety with smooth and continuous movement of all traffic, both car and foot. Road and traffic signals are designed largely so drivers can clearly differentiate their shapes and colors from their surroundings. It is the duty of the Swedish Road Administration to label all signs and road markers located in the region. Sweden's traffic signals are strictly regulated by the government. They are placed two meters from the road and the basesign is at a height of 1.6 meters for roads used by vehicles with engines. According to the Road Administration, the total number of signs on a single pole is three, with the most visible sign in the middle.All signs are designed to have a reflective surface, in line with European signs, attached to designated sign areas. Most road signs in Sweden use pictograms to display sign messages. There are also a number of examples where words override pictogram. Another example of that kind of symbol is the STOP button. Both signs use Swedish text except the STOP sign which replaces the Swedish word 'STOPP' with the English word 'STOP.' On most European signs the normal background color on warning signs and prohibition signs is white, while in Sweden this color is yellow. This is explained by the increase in the luminosity of the signs during winter.

II. EXISTING SYSTEM

Automatic identification and recognition of traffic signs is an integral aspect of automated driver assistance program. Traffic signals have many identifying characteristics to track and recognize them. Traffic symbol information, such as shape and color, may be used to position traffic symbols into different groups; however, there are many variables that may impede successful identification and recognition of traffic signs.

Such causes include changes in orientation, lighting differences (including variations caused by shifting degrees of light, sunset, fog, and shadowing), sign occlusion, motion blur, and degradation of weather-damaged signs. Road scenes are typically very cluttered and contain multiple stable geometric features that can easily be misclassified as signs of the lane. Accuracy is a vital factor as the driver may be negatively impacted by only one misclassified or undetected. The suggested program is composed of two stages:

A new application of maximally stable extreme regions (To the MSERs) is used for detection.

Recognition is carried out with gradient-oriented histogram (HOG) functions, which are classified using a linear vector support machine (SVM).

III. PROJECT IDEA

Detection and identification of traffic signals has taken an growing interest in Last several years. This is because of the wide variety of requirements a machine with this capability offers:

Highway maintenance: A human person today needs to monitor a videotape to check the signs' position and condition. This is a boring job because from time to time the signs appear, and so the user needs to pay careful attention. The Esprit European project AUTOCAT introduces a van designed to capture traffic sign locationautomatically.

Sign Inventory: Essentially the same program except in cities and towns. In this case the environment is harder than highways. The signs are not necessarily identical to the car movement, causing a deformed view of the signals; there are also occlusions and other objects of the same colour.

The advantage of this idea is that some precise information is added to the sign, such as indicating the path to be followed by the robot or some task it has to perform at a specific location.

IV. PROBLEM STATEMENT

Detection of the RTO symbol board on the highway, cities by image processing using raspberry pi and show as a video message and representation of it in text to speech form using deep learning algorithm.
Padding is not appropriate because it can be found that all such sources produce noise that is primarily in the lower frequency spectrum of which passive noise cancelling strategies like as shielding. Those techniques can cancel disturbances in higher frequency ranges. Thus we decided to use active noise cancellation instead of passive here.

V. PROPOSEDIDEA

The block diagram is the schematic representation of the project thus helping to explain the methods of the project. A preprocessing unit is used in this project for signal conditioning i.e. enhancement, filtering etc. For cancelation purposes the Optical Signal Processor is used to invert the inputsignal. The camera takes the image of the sign board, and is attached to the microcontroller. Microcontroller is circuit brain. It is connected to Audio Module and Power Supply. Microcontroller must have all of the RTO symbols contained in a data set. This image is further processed into Image Processing module and CNN classifier. Finally display connects to the module for image processing. Here we are using Raspberry Pi 3 B + microcontroller. Raspberry pi requires a linux operating system equivalent to Raspbian Operating System. It supports domain IOT. Flash card is a raspberry hard disk. We require a memory card with 64 GB of Class 10. Intex camera with 30 FPM feature is to be used. Camera captures image from roadside traffic sign board. We will send the image in our system after capturing the signal, then as per our qualified model, it will show out what the sign is for. We are editing the details in our data collection for the training model. Steps in pre-processing are Image encoding, conversion of gray scale, Image threshold and then we transfer image to algorithm. CNN's Convolutionary Neural Network is the algorithm we use in training our model. CNN consists of four strata. Then we detect the sign from our data set. While process is performed on raspberry pi, as per our labeled image. We may then limit this machine to car.

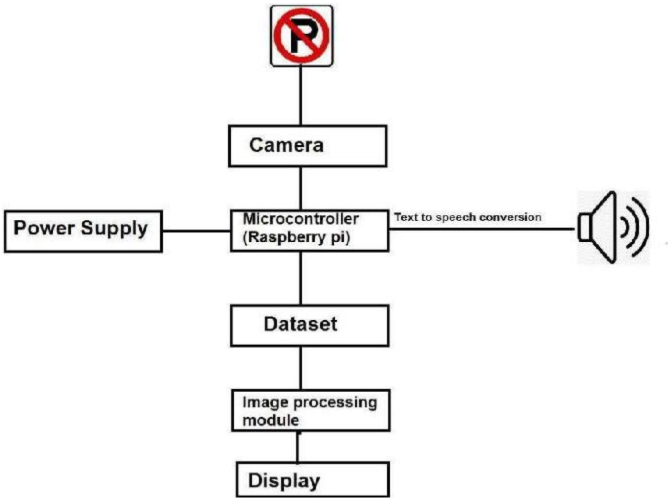

FIG.SYSTEM ARCHITECTURE

VI. PROJECT SCOPE

- Consider the recognition feature property of road and traffic signals and their effects on image processing.
- Color capture, color spaces and color space transfer.
- Develop robust color segmentation algorithms that can be utilized under a wide range of conditions.
- Creates an invariant recognizer based on invariant shape measurements for in-plan transformations such as translation , rotation, and scaling.
- Identify the easiest way to remove features from road signs.
- To construct an efficient road sign classification algorithm.
- To determine the efficiency under different temperature, lighting geometry and sign conditions of the above robustness approaches

VII. PROJECT SCOPE

- The program proposed can be introduced in households located in places with heavy trafficlevels.
- Medical facilities where noise reduction, such as intensive care units (ICUs), neonatal intensive care units (NICUs), cardiac treatment units, is quite important;
- Although the system is proposed for small spaces, this may apply to large halls / rooms when further research is undertaken.

VIII. APPLICATION

- It's very useful for people that are capabledifferently.
- Instead of reading the text, the option to hear the text can provide valuable information in a way that is more user-friendly.
- Avoiding environment for drivers to keep an eye on thedashboard
- The system can be implemented to reinforce the concept of auto drivendriver.

IX. ADVANTAGES OF PROPOSED SYSTEM

- The system provides driver assistance by allowing drivers to receive real-time audio input of sorrounding warning / rto warning signs on the road to reduceaccidents
- Further system can be upgraded to deliver audio messages in local native language driverassistance
- Multitasking may beenabled
- Used as an efficient and speedier process approach as it implements a deep learning algorithm.•
- Enhance road safety, because it makes drivers pay heed to the signals ofRTO.

X. RESULT

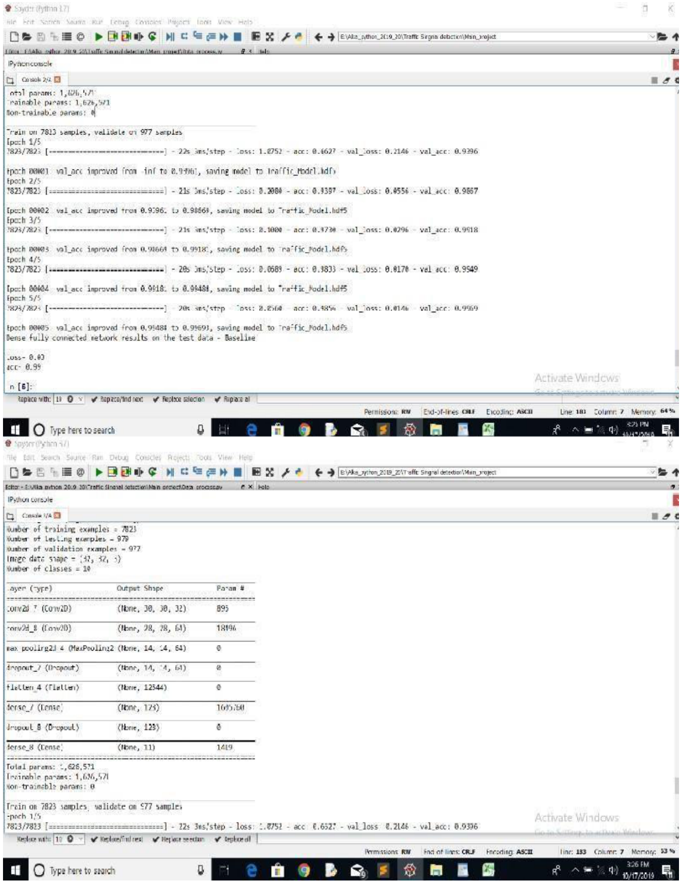

Fig:-Spyder module results

XI. CONCLUSION

An image based method of detecting on highway the RTO patterns, cities using camera with the aid of raspberry pi and viewing on the dashboard of the vehicle. The profile of Indian rural and sub-urban roads in our model is consistent thus making extracting the road component very difficult.
The other parameters considered are fast identity identification. The expected conclusion is that with the help of the latest technology, which is machine leaning will detect traffic signs. In this mission, CNN algorithm finds best output for identification, image data collection , identification of signals. Machine was expected to be able to detect and recognize traffic signs as quickly as possible. We conclude that our model performs the best way to achieve the same expected result. Because image is taken from a moving vehicle, such an image usually has a certain blurring effect.
But these effects are minimized because of the camera's straight direction, and therefore no special deploring algorithm isneeded. The results give promising detection efficiency. The tracking of events detects the desired items with optimum efficiency.

ACKNOWLEDGMENT

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