THE LANE DETECTION ON ROADS USING COMPUTER VISION

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ABSTRACT: In recent times many technological advancements are coming in the domain of road safety as accidents has been increasing at an alarming rate and one of the crucial reason for such accidents is lack of driver's attention. Technical advancements should be there to reduce the frequency of the accidents and stay safe. Lane detecting system is an essential component of many technologically intelligent transport system. Although it's a complex goal to achieve because of vacillating road conditions that a person encounters specially while driving at night or even in daylight. Lane boundaries is detected using a camera that captures the view of the road, mounted on the front of the vehicle. The approach used in this paper changes the image taken from the video into a set of sub-images and generates image-features for each of them which are further used to detect the lanes present on the roads. There are proposed numerous ways to detect the lane markings on the road. Features-based or model-based are the two categories of the lane detection techniques. Down-level characteristics for example lane-mark edges are used by the feature-based functions.

I. INTRODUCTION

The traffic safety becomes more and more convincing with the increasing urban traffic. Exiting the lane without following proper rules is the root cause of most of the accidents on the avenues. Most of these are result of the interrupted and lethargic attitude of the driver. Lane discipline is crucial to road safety for drivers and pedestrians alike. The system has an objective to identify the lane marks. It's intent is to obtain a secure environment and im-

proved traffic surroundings. The functions of the proposed system can range from displaying road line positions to the driving person on any exterior display, to more convoluted applications like detect-

ing switching of the lanes in the near future so that one can prevent concussions caused on the. Actuate detection of lane roads is a critical issue in lane detection and departure warning systems. If an automobile crosses a lane confinement then vehicles enabled with predicting lane borders system directs the vehicles to prevent collisions and generates. These kind of intelligent system always makes the safe travel but it is not always necessary that lane boundaries are clearly noticeable, as poor road Inadequate quantity of paint used for marking the lane boundaries makes it hard for system to detect the lanes with accuracy and other reasons can include environmental effects like shadows from things like trees or other automobiles, or street lights, day and night time conditions, or fog occurs because of invariant lightening conditions. These factors causes problem to distinguish a road lane in the backdrop of a captured image for a person. In order to deal with above stated problems arising due to changes in lane boundaries. System can be installed in cars and taxis in order to prevent the occurrence of due to reckless driving on the roads. In school buses as it will guarantee the safety of the children. Moreover, performance of the driver can also be monitored, Road Transportation Offices can use the setup to check and report the negligence of drivers and lack of attention on the roads

II. PROPOSED SYSTEM

Proposed Model for Lane Detection System**.** The model which is used for the detection of lanes in this paper is explained with the help of a flowchart in above figure. The arrangements bounded by the type of traffic environment and avenues mentioned atop permit to compute a practical collection of conditions which a person may confront during driving in the darker. It shows the aspects of the proposed lane detection system when checked on a time span of 5 hrs over the acquired video. A simple frame-wise access to permit bendability in conclusions when approved on videos with varying frame rates one can prefer this measurement is preferred over the other measurement techniques. In Table I, the percentage of accurate detections per minute is represented by the correct column whereas, the percentage of inaccurate positives and undetected lanes are represented by Incorrect and Misses column respectively. Efficiency per minute of the system can be measured to check the accuracy of the system. Moreover, neighbouring vehicles and the lightning from their headlights appeared to have very less to no changes on the average efficiency estimation. The high contrast of the lane markers on isolated highways which are culminated in the high detection rates are as shown in Table

III. METHODOLOGY

Lane Detection Techniques:

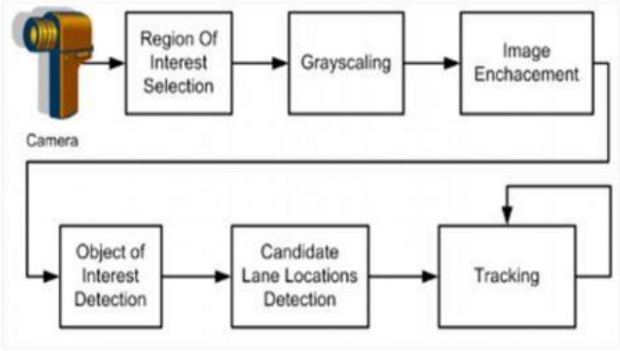
Further establishes both the and RNN detectors is effective in detecting lanes. First a picture of the road is acquired with the assistance of a camera attached on the vehicle. Next one may reduce the processing time by translating the image to a grayscale image. Next, the existence of

disturbance captured in the image will interrupt the accurate detection of the edges, so one can activate filters to get rid of noises. Some of the filters which can be used are bilateral filter, gaussian filter, trilateral filter. Line detector can then use it for the purpose of detection. It will generate a left side and right side segments of the lane boundary. As a result, yellow and the white lanes are obtained using the RGB color codes. Methods that one may make use of have been studied in this paper. Many of them resulted in inappropriate conclusions. Hence, other enrichments can also be included in the present approach in a way to increase the efficiency of the setup. In the coming future, one can change the current Hough Transformation so that it can sum up curved and straight roads respectively. This approach cannot give accurate results in poor environmental conditions like on hazy, cloudy, rainy and stormy days, therefore one needs to make amendments in it.

Highway type	Traffic type	Average Accuracy Per Minute		
		Correct	Incorrect	Misses
Isolated	Light	92.27%	6.49%	1.22%
	Moderate	92.14%	4.43%	3.45%
Metro	Light	82.41%	12.6%	4.91%
	Moderate	75.56%	20.17%	8.26%

A Layered Approach To Robust Lane Detection At Night :

The velocity enhancement is obtained from the decrease in the size of the image to be processed. The accuracy can be improved by the alimentation of objects that are present outside the ROI that may have characteristics same as to lanes. In this implementation, the ROI is set manually; whereas, to automatically determine a suitable ROI, camera calibration parameters could be used. The conversion of a color image into a gray scale image is the only pre- processing used in this lane detection system; consequently, monochrome images can circumvent this step. It is assumed that the accessible colorful picture is present in Bayer format. Firstly it is demised to extract the color of each pixel. The adaptive threshold is used to retrieve the lane markers in the average picture. The adaptive threshold changes depends on the features of its nearby pixels in comparison to a global threshold. This is advantageous as isolated bright objects like street lights and taillights of cars would influence the global threshold, the adaptive method would not be easily altered. In earlier stage, the binary image that is obtained by application of the adaptive threshold is divided into its left and right halves. Next, a low resolution Hough transformed is calculated on each hal image in order to get the positions of straight lines with respect to lanes.



Region of Interest :

A region of interest (ROI) is that area of an image that one want to percolate or allow some other operations on them. One can use the high-level ROI functions in order to create ROIs of many shapes, for example drawpolygon or drawcircle in the library of openCV. The main objective of ROI is to decrease the portion of an image for speedy calculation and also the size of image can be decremented by ROI generation. One can describe several ROI in an image. Most general use of an ROI is to generate a binary mask image which is defined as the combination of 0 & 1 in the image file matrix. Pixels that belong to the ROI are set to 1 that is white and pixels outside the ROI are set to 0 that is Black In the mask image.

IV. DATA SET :

COLLECTING DATA:

Here the data process can be collected from the video. In the video we device the pics and upload here to present the data. But actually the data set is taken from the video here we didn't upload the video so we used photo of that video part.

For Sample I Am Displaying Some Data Collected

Define Color Masks

Defining color masks allows color based pixels selection in an image. The intention is to select only white and yellow pixels and set the rest of the image to black.

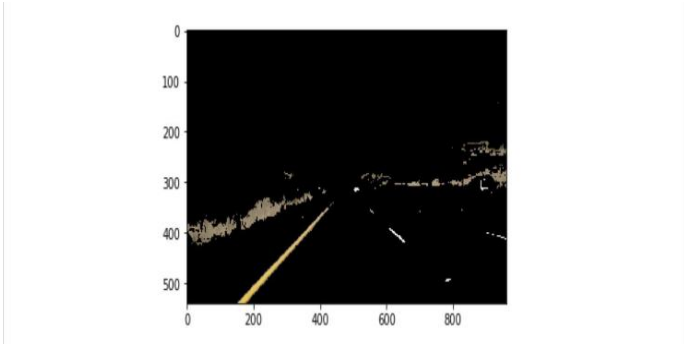
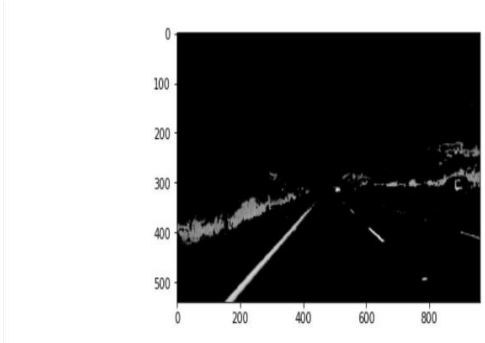


Fig.1. Define Color Masks



To prepare for edge detection it is usefull to smoothen the image so artificial edges are not detected due to noise.

Detect Edges

The main reason for this is the further need to compute line equations from independent pixels.

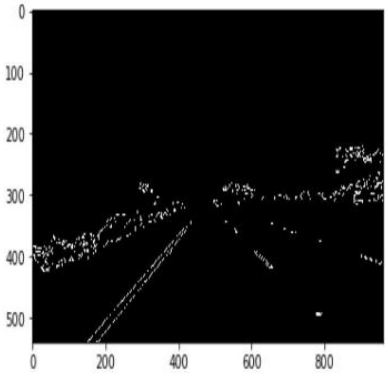


Fig.2. Detect Edges

Edges are detected using the Canny Edge Filter appliend to a grayscale image. The algorithm will first detect strong edge (strong gradient) pixels above the high

Select Region of Interest:

Mask is initially a zeroes matrix of the same size as the grayscale image. The mask is applied using bitwise_and to the grayscale image.

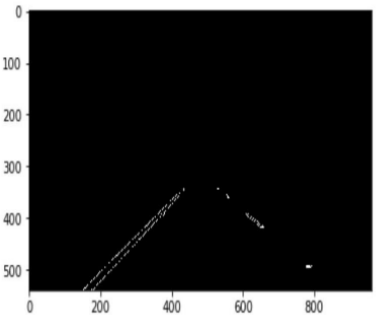


Fig.3. Select Region of Interest

Find Lines from Edge Pixels:

When using the Hough Transform to find lines from coliniar pixels, rho and theta are defined to allow

These lines are computed with the HoughLinesP function that applies the transform on the edges in the region of interest. Once the lines found, they are drawn over the original image for confirmation.

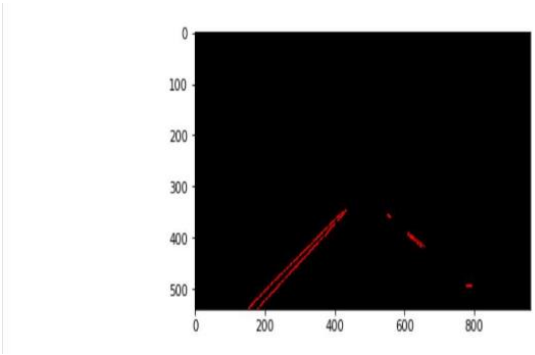


Fig.4. Find Lines from Edge Pixels

Extrapolate Lines:

In order to draw a single line on the left and one on the right lane lines, the draw_lines function is built to extrapolate from the multiple individiual lines found using the Hough Transform.

imshape[0]/10 and with the horizontal bottom line of the image: y = imshape[0]

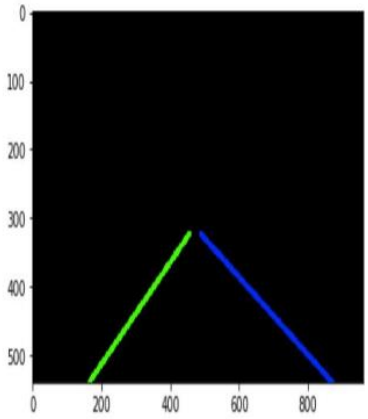
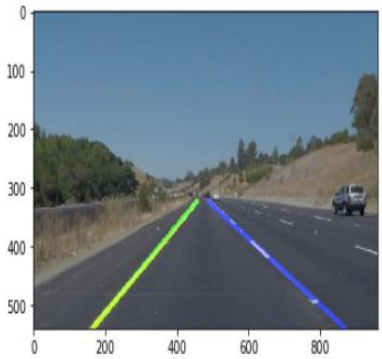


Fig.5. Extrapolate lines

V. RESULTS

Using the two intersection points, the extrapolated line is drawn on the original image. For better visualization, the left line is green while the right one is blue.



VI. CONCLUSION

The approach used in this paper changes the image taken from the video into a set of sub-images and generates image-features for each of them which are further used to detect the lanes present . There are proposed numerous ways to detect the lane markings.

VII. REFERENCES:

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