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# DETECTING OF MULTIPLE LANE IN THE HIGHWAY SCENARIO

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***Abstract*:** Multi-lane detection is performed to provide safety for the vehicles. This Paper provides the result of detecting the multi-lane detection with the varying climatic conditions. The main objective of the paper is to provide the assistance for the drivers in order to avoid the unnecessary accidents. The existing lane detection has many flaws in the results as it concentrate on the low level factors. It does not provide consistent result with source of illumination and the shadow of objects. The proposed system estimates the adjacent driving lane in all the conditions using efficient canny edge detection and peak adjacency values to assist the drivers.

**Keywords**: Lane Detection, Hough Transform, Peak detection, Warning system.

## I. Introduction

A multi-lane detection system is necessary for the adaptive driver assistance system (ADAS) and the independent driving of intelligent vehicles. The need for the multi-lane detection algorithm has arise because it allows us to localize ego-vehicle as well as gather surrounding road sign information and vehicles when overtake. Traffic problem is becoming more and more serious issue with the increase in number of vehicles most of the traffic accidents are caused due to the negligence of the drivers. In order to reduce the accidents and to improve the efficiency of the vehicles Intelligent Transportation System has been discovered. Lane Detection System is used in the automated vehicles to assist the driver about the change in the driving lane. Lane Detection algorithm supports various applications like **Lane Departure Warning system**- the vehicle turns sharply away from the lane .**Lane Assist**-indicating the driver by any form while moving away from the lane. **Lane Centring**-maintaining the vehicle in the centre position while driving. This paper presents about the Driver Assistance System. Scope of the paper is to help the person's who are new to the driving environment, Alert the driver when they are unconscious and mainly to avoid accidents.

## II. Existing System

The existing system has many flaws in their system due to the source of light influence, change in the weather conditions, shadows of objects on the lane and the distance of region calculation. The purpose of the lane detection is to provide safety for the people. The algorithms that are implemented in the existing system are not much efficient to provide the results. The system concentrated on the various low level features such as colour, lane markings and textures. These features are restricted only to their specific road conditions and other structured roads. Our aim is to assist the driver in all the critical situation and to avoid unnecessary accidents.

## III. SYSTEM DESCRIPTION:

Camera position:

The camera is the hardware source used in this paper to read the video as an input source. We can place the camera either in the frontal view or the lateral view. But the lane markings are always seen as the line with constant with lateral camera placed [7]. Camera is placed in the centre of the winshield which covers about 20m wide of the lane in front of the vehicle. It records the features of moving road ahead.

i. Image Acquisition:

from the cameras to the matlab or the Simulink. Image acquisition is the first process in the image processing. Usually lane warning system use sensor types to get an input. Here we have the input of 10 frames/sec with a pixel size of 240x320. One of the main goal of this process is to have a source of input that operates within such control and measured guidelines.

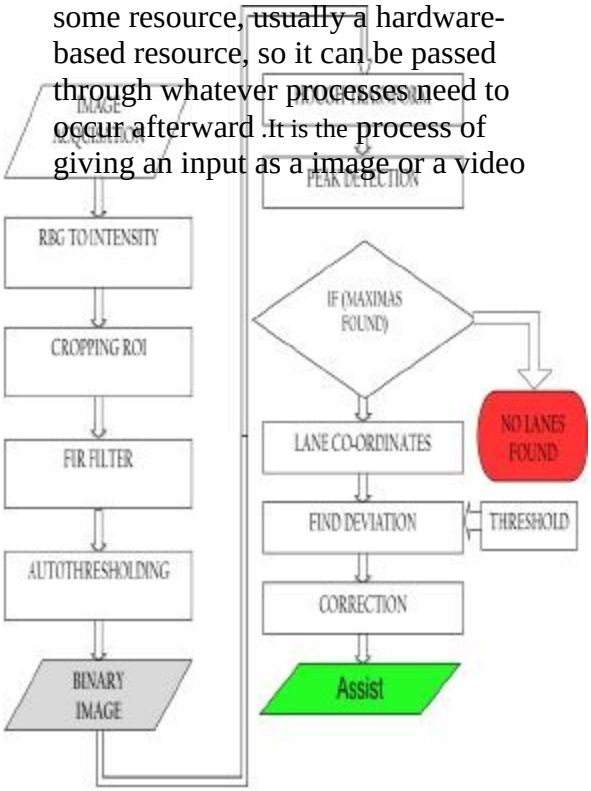
ii. RGB to intensity:

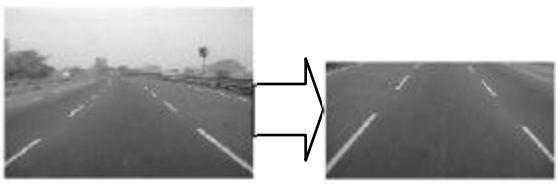
It is used to convert the true colour images from rgb to gray-scale intensity image. The rgb to gray function converts rgb image to gray-scale by eliminating the hue and saturation information while retaining the luminance factor. When converting from rgb to gray-scale it is said that the specific weights to channels rgb to be 0.29(R) 0.59(G) 0.11(B).

iii. Cropping ROI:

Region of Interest is a selected subset of samples within a data set identified for a particular purpose. ROI is a portion of image that we want to filter or perform some other operation in it. We can define ROI by creating a binary mask defines in the range 0 to 1.We can define more than one ROI in an image .The regions can be geographic in nature, such as polygons that include adjacent pixels, or they can be defined by a range of intensities. The input frame is cropped into the particular pixel of size 105x320 to perform the operations.

Image acquisition in image processing can be broadly defined as the action of retrieving an image from some resource, usually a hardware-based resource, so it can be passed through whatever processes need to occur afterward .It is the process of giving an input as a image or a video



iv. Creating a binary image:

The cropped pixel of frame 105x320 is then performed with the threshold process which is used to create the binary image using Otsu's method. This process is performed with the constant value say't'. Then replaces the pixel values with black with whose value less than the constant 't' and others with white pixel , whose value greater than the constant 't'. This method computes the threshold value of the image by splitting the image there by reducing the intensity of the image.

v. Edge Detection:

It is the image processing technique for finding the boundaries of objects within the images. It is used for identifying the points in the digital image at which image brightness changes sharply or more formally has discontinuities. Efficient canny edge detector has been used so that no edge points has been missed and that there be no response to non-edges. The distance between the edge pixels are calculated and that the actual

vi. Hough transform:

When the image are used in the different part of the image analysis we need to reduce the amount of data while preserving the important structural and characteristic information. The image from the edge detector are still with the pixel notation. The Hough transform takes a binary edge map as input and attempts to locate edges placed as straight lines. Every edge point in the edge map is transformed to all possible lines that could pass through that point. The intersection of the Hough space lines indicates the line that pass through both 0 and 1.

Mapping of one unique line to the Hough space.

vi. Peak Detection:

edge is set to minimum.

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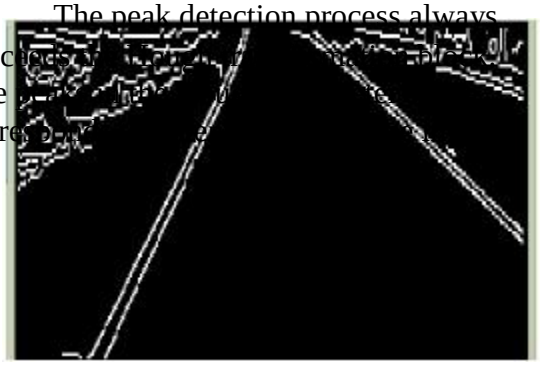
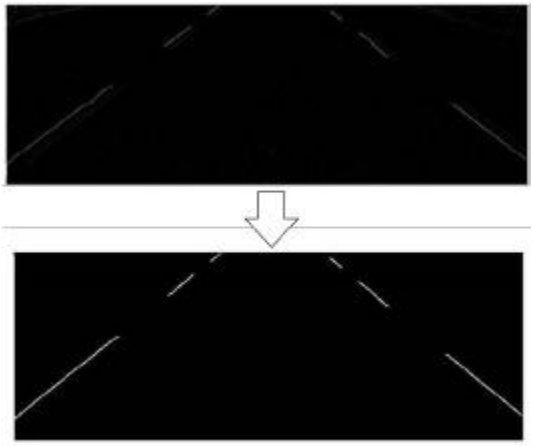
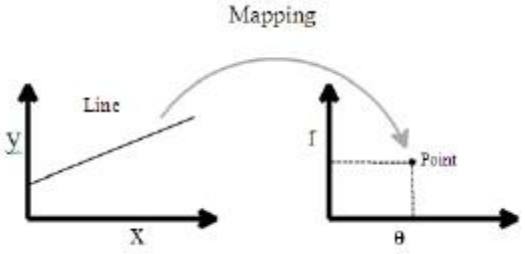






Step 1: Instead of detecting one peak (lane), more than one peak is detected.
Step 2: The detected n peaks are compared with the true lane of the previous frame.
Step 3: The false peaks are eliminated and only the true peak is sent to the next process.

In the Hough parameter space, each and every single point corresponds to a rho and theta value which represents a line. When a curve
is drawn for a line it includes all the possible lines through it. When two curves intersect, the point of intersection represents a line in which these points are present. Similarly for n number of pixels if lie on the same line, the curves will intersect at point where these pixels are located. This way the intersection corresponds to the potential lines of the image.

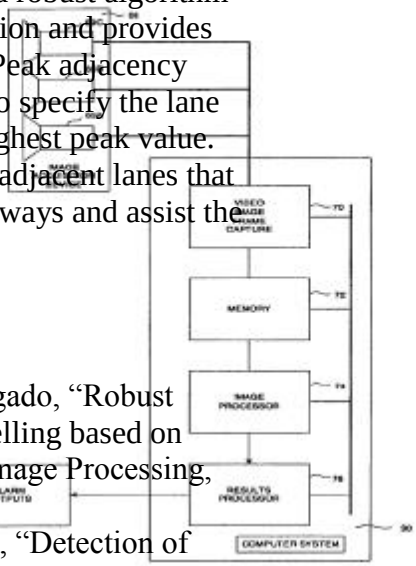
## IV. CONCLUSION:

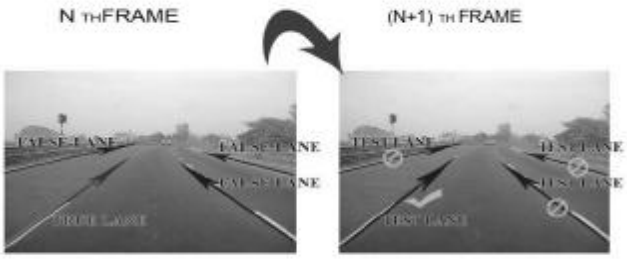
situations where other vehicles or object which may resemble like a lane may interfere with the system's lane detecting system. In order to eliminate these situations the following algorithm is developed.

False Peak Elimination

The false peak elimination is very useful in

This paper uses a robust algorithm for the multi-lane detection and provides safety for the vehicles. Peak adjacency matrix values are used to specify the lane co-ordinates with the highest peak value. This method covers the adjacent lanes that are available in the highways and assist the driver.

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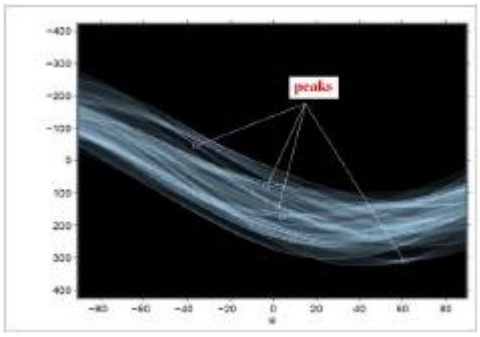

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