CBIVR REVIEW 3:

Brief review of the state-of-art in the field (National & International)), Scientific importance of the topic

RESEARCH PAPER:

1)

Y.Li et al. (2014) [18]

Canny edge detector

Hough transform, Kalman filter

Poor performance in heavy traffic, confusing road textures and uneven illumination Suitable for straight roads

To detect the edges in ROI, Canny edge detector is used in [18]. The straight lines are detected from the binary output of Canny edge extractor using Hough transform. To eliminate effect of noise local maxima features are searched along the estimated lane boundary. Then RANSAC algorithm is applied to eliminate outliers. The final local maxima features are fit into a straight line. Next Kalman filter is used to track the lanes in remaining frames.

2)

H.Jung et al. (2013) [25]

Steerable filter

Haar like features

Robust in illumination changes

Lane departure warning included

Jung et al. [25] proposes a lane detection algorithm which uses Haar like features to obtain candidate lane points. The image is divided into two rectangular regions. Diagonally directional steerable filters are used, as lane marker appears diagonal due to perspective effect. Approximated steerable filter is used to the Haar like features and maximal response is obtained. The left and right lanes are computed. As the lanes are parallel, they will converge at vanishing point. This hypothesis is verified to check the correctness of detected lanes. After detection lane departure can be determined based on the distance between vanishing point and the horizontal central line. If the distance increases there is a lane departure.

3) V. S.,Bottazzi et al. (2014) [19]

Histogram Segmentation

Lucas-Kanade tracking Robust in illumination changes

Based on Triangular prior model

Bottazzi et al, [19] proposes a histogram based illumination invariant lane detection method. A dynamic region of interest (DROI) is defined using a prior triangle model. First the histogram of the whole image and road frame are calculated. The difference between the two is used to find out the illumination changes. From the ROI lane markers are segmented. The algorithm uses Lucas Kanade tracking to track the lanes.

4) Lin et al. (2010) [15]

Sobel operator with non maximum suppression

Directional edge gap closing and Hough transform

Adaptive to various road conditions

Lane departure warning included

Lin et al. [15] proposed a method based on region of interest (ROI). The ROI first initialized and Sobel operator along with non-local maximum suppression is used to find the edge pixels. After obtaining the edge image, an extended edge linking based on directional edge gap closing is done to link those dashed lines in far vision field which are broken due to down-sampling. A raster scan is performed from the bottom of image and the starting point of new edge is found out. Then an edge tracing is carried out and next pixel is added to the edge which is eight connected to the current pixel. For a given starting point the tracing is done in one orientation. The next step is directional edge gap closing. The edge links are extended by adding a user specified number of pixels along the orientation to fill gaps. New pixels are selected from the neighborhood of start and end points. After this those edges with length less than 15 pixels are eliminated. Then two edge link pair are considered and if the distance between them satisfies width of lane mark, then it is regarded as lane mark region.. Next step is lane hypothesis verification, for that the color of lane-marks are checked. After the candidates are finalized, Hough transform is used to determine ρ and θ values.

METHODOLOGY:

In this project, MATLAB is used as an Image Processing Tool to detect Lanes on the road. The following techniques are used for lane detection.

Color Masking

• Canny Edge Detection

• Region of Interest Selection

• Hough Transform Line detection

Pre-processing the Image:

The first step is to import the video file and initialize the variables to be use din the code. Some variables are also imported from the .mat file to be used in the code.