Finding Lane Lines on the Road

The goals / steps of this project are the following:

* Make a pipeline that finds lane lines on the road

* Reflect on your work in a written report

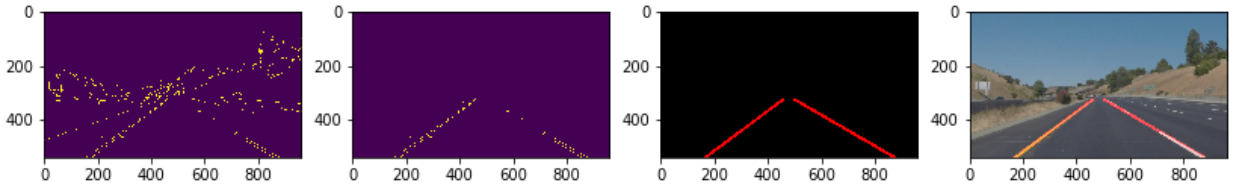
1. Introduction:
   Goal is to apply the provided OpenCV functions to detect lanes in an image and later on a video by following a pipeline.

Fig.1: Provided Image

   Fig.1 is taken from the camera mounted on the car.

2. Reflection:
   Following steps/ pipeline is followed:
   a. Color image to grayscale image
      To get single channel image
   b. Smoothing and noise reduction
      Gaussian Smoothing is applied
   c. Canny Detector
      Detects edges in an image
   d. Region of interest
      Assuming the white line (from fig.1) will always appear at the same location. A trapezoidal region is defined based on the image size.
   e. Hough Transform

For detecting continuous lines/ dashed lines which are part of one line with same slope. Later weight is added to it.



3. Result:
   Code- P1.ipynb
   Videos- test_videos_output folder

4. Potential shortcomings
   a. Not performing well for curved lane markings
   b. During occurrence of other vehicle in region of interest
   c. When road lightning conditions are varying

5. Suggested improvements
   a. Continuous line/ edge tracker
   b. Automatic Region of interest selection
   c. Filters for handling varying lighting conditions