Finding Lane Lines on the Road

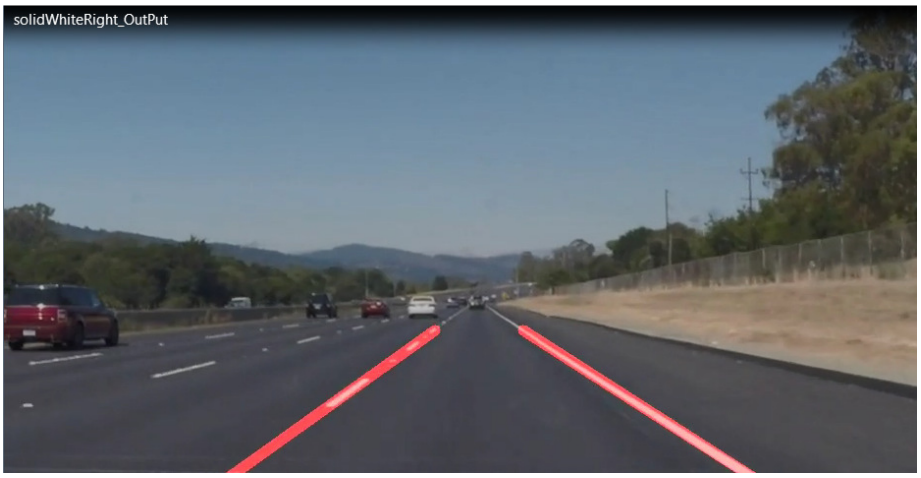
When we drive, we use our eyes to decide where to go. The lines present on the road that show us where the lanes are, will act as our constant reference for where to steer the vehicle. Here the algorithm is described to detect the lane lines automatically in detail.

In this project the lane lines are detected using python and openCV

Reflection

Steps to detect the lane lines on the road:

1. Convert the image into grayscale
2. Use Gaussian smoothing to blur an image using Gaussian function
3. Apply canny edge detection algorithm with considering the gray image as an input with considering some high and low threshold for edge detections. The algorithm will first detect strong edge (strong gradient) pixels above the high threshold, and reject pixels below the low threshold.
4. Region of interest mask to filter out detected line segments from other areas of the image.
5. Hough Transform to find lines from canny Edges. To find lane lines, it is required to specify some parameters for defining the nature of lines to detect (i.e., long lines, short lines, bendy lines, dashed lines, etc.).
6. Draw the lines with calculating the left and right line on the edge image.



Potential shortcomings with current pipeline

This is a basic implementation for the lane detection.

1. The region of interest vertices are hard-coded, which might not be supportive with different scenarios
2. It will not work if the road is curvier and lane markings are not clearly visible.

Possible improvements to pipeline

1. To make the algorithm more robust, so that it will work in all kind of scenarios.