Marco Intermite
Self Driving Car - Term 1
18 February, 2017

Finding Lane Lines on the road

The goals / steps of this project is to make a pipeline that finds lane lines on the road

Reflection

My pipeline consisted of different steps in managing the image first and then elaborating a draw_line() function able to summarize the left and right lanes in 2 single lines.

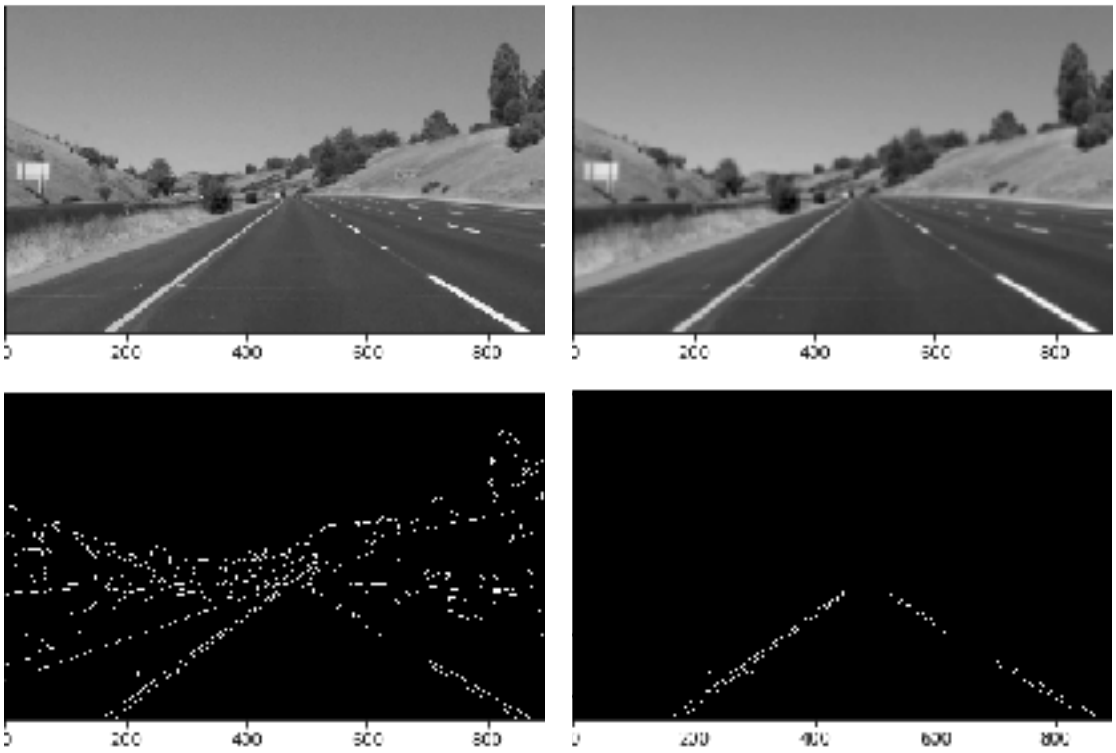
Initial Image:

Steps for recognizing the lanes:

1. Grayscale the image
2. Blur the image with parameter Kernel = 3
3. Applying Canny with Low thresholds = 20 and High tresholds = 60
4. Masking the image with a polygon in front of the car
5. Hough Transformation with parameters:

- rho = 1
- theta = np.pi/90
- threshold = 15
- min_line_len = 40

- max_line_gap = 20



6. Draw the a single line on the left and right lanes in an empty image
7. Overlay the single lines on the initial image

Final result of the above steps:

I modified the draw_lines() function by:

- Filtering the lines identified considering only lines with an m between 0.5 and 0.8 (abs m). This in order to consider only vertical lines and discard more horizontal lines
- Considering the lines on the left as line with negative m and considering the lines on the right as line with positive m.
- For each line in the left side and right side I took the longer line, left and right respectively, as base line to draw the left and right line.
- I used the mask perimeter to set a perimeter to draw the left and right line

Shortcomings

- The images and video they have to be shot consistently as the masking applied is expecting the lanes placed similarly.
- The draw_lines() function is identifying the single lines base on the longest line per each side. Considering that the longest line is in most of the cases in the bottom of the image, the single line will not represent always the average between the different lines. Furthermore, in the video, the transition between frames will be rough.

Improvements

- Avoid to hard code the parameters used in managing the image, and find a way to define parameters dynamically basing on the image composition
- Improve the draw_lines() function in order to better represent the average of the single line and having smooth transition between frames in the video.