Finding Lane Lines on the Road - Writeup

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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

Reflection

1. Describe your pipeline. As part of the description, explain how you modified the draw_lines() function.

My pipeline consisted of 5 steps. First, I converted the images to grayscale using “cv2.COLOR_BGR2GRAY”, then I blurred the image. I used a kernel size of 5. It looked like the best solution. A kernel size higher that that resulted in a decrease of the quality of the output lines. After that, I implemented the Canny Edge Detection. I used a low threshold of 40 and a high threshold of 180. Then, I detected the region of interest optimized for the SolidWhiteRight video. Next, I implemented the Hough Transformation function to detect the lines in the Region of Interest.

In order to draw a single line on the left and right lanes, I modified the draw_lines() function by dividing the lines detected by the Hough function in lines with positive slope (should indicate right lines) and lines with negative slope (should indicate left lines). Then I selected the minimum and maximum values of x and y for each set of lines. So I ended up with a left line and a right line.

In conclusion, I mixed the original video with the line video and I ended up with the requested output.

2. Identify potential shortcomings with your current pipeline

One potential shortcoming would be what would happen when changing pan, tilt and zoom of the camera. The output could be less accurate or completely inaccurate.

Another shortcoming could be that a different light in the video (evening or a cloudy day) could make line detection impossible.

An additional shortcoming could be that snowing or rain would make line detection impossible, as well.

3. Suggest possible improvements to your pipeline

A possible improvement would be to to considerate the slope of the right line and the left line and extend the lines till the bottom of the video (x,y=540). In the same way, I could extend the lines till the road horizont, but that would be more difficult.

Another potential improvement could be to consider different light conditions and create an adaptive pipeline to get the optimal result.