Writeup – Finding Lane lines

Reflection

1. Describe your pipeline.

My pipeline function is composed of 5 steps described and enumerated below:

1) I make a copy of the input image of the function.
2) I use the helper function “grayscale” to convert the input image to grayscale.
3) I defined a kernel size of 5 for Gaussian smoothing / blurring, using the “gaussian_blur” helper function.
4) I defined the thresholds for Canny edge detection with low_threshold = 80 and high_threshold = 160, then used the helper function “canny_edge”.
5) Added a variable “imshape” to determine the dimensions of the image.
6) Added a variable “vertices” to define the polygon that will be used for the region of interest.
7) Mask the image using the helper function “region_of_interest” which takes as input “canny_edge” and “vertices”.
8) Apply Hough transform to the masked image using the helper function “hough_lines”, also in this step I am using the variable “lines” as an output of the “hough_lines” which I will use later on to average the slopes.
9) I included the function “average_slope” that returns a left_lane and a right_lane which come in the form of a (slope, intersection). This means is averaging the “lines” and creating a single lane for all the left lanes and another single lane for the right lanes.
10) I defined variables “y1” and “y2” to set the limits to draw the lines on the image for which I created another function called “make_line_points”. This function convert the lines from “average_slope” into pixel points.
11) Defined an array called “lanes” composed of the elements “lanes = [[left_line, right_line]]”
12) Finally use the function “draw_lines” to overlay the lanes on the initial_image.

2. Identify potential shortcomings with the current pipeline

One potential shortcoming would be what would happen when a curve line appears in the road, since the average_slope is basically creating straight lanes when a curve comes in the pictures generates an overlaid line way off the real lane markers of the road.

Another shortcoming is that I had to define a low horizontal limit to draw the lines, this is to prevent the left lane and right lane to come across one each other and cause the algorithm to fail.

Lastly, one shortcoming is the lanes jitter a lot.

3. Suggest possible improvements to the pipeline

A possible improvement would be to use hsv filters to do a better detection of yellow lanes than just graying the image.

Another potential improvement is to refine the algorithm to not just make an average of the lines but also take into account curves.