

# Finding Lane Lines on the Road

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## Writeup Template

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**You can use this file as a template for your writeup if you want to submit it as a markdown file. But feel free to use some other method and submit a pdf if you prefer.**

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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
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## 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

1. Converted the images to grayscale
2. Apply canny edge detection
3. Apply a polygon (quadrilateral) region mask to keep edges in the area of interest
4. Do a hough transform to get the lines from the image from step 3 and extend the lines to be full “guide” lines for the left and right.
5. Overlay the lines above the original image

In order to draw a single line on the left and right lanes, I modified the `draw_lines()` function by

1. Filtering the lines within a certain range of slope (0.4 to 1.0 and -1.0 to -0.4)

2. Separate the lines as right lines and left lines based on the sign of the slope
3. With all the points  $(x, y)$  from each of the right and left lines, fit a polygon
4. Using the polygon, compute  $x$  values for given  $y$  values (bottom and top) and draw a line between these two points (do this for both the right and left lines)

## **2. Identify potential shortcomings with your current pipeline**

One potential shortcoming would be what would happen when polygon fitting is inaccurate. Since the method above uses two  $y$  values for the beginning and end of the line, this causes the line to be mis-aligned. This can be seen in the challenge video as well.

Another shortcoming is that I am using a fixed value as the upper limit for  $y$  (320), this causes the lines to be fixed length and suffers significantly in the challenge video.

## **3. Suggest possible improvements to your pipeline**

A possible improvement would be to fix the shortcomings mentioned in 2. The key thing is to eliminate fixed constant values that apply to this specific scenario and limit the solution from being generic.