

# Finding Lane Lines on the Road

## 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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### Finding Lane Lines on the Road

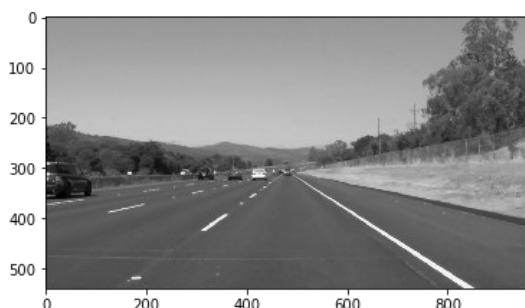
The goals / steps of this project are the following:

- Make a pipeline that finds lane lines on the road
  - Reflect on your work in a written report
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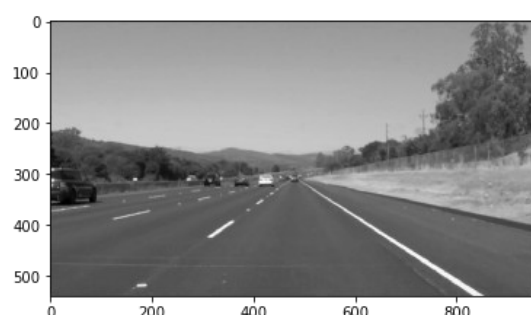
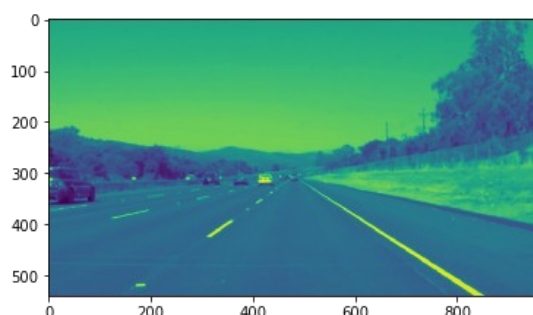
### Reflection

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

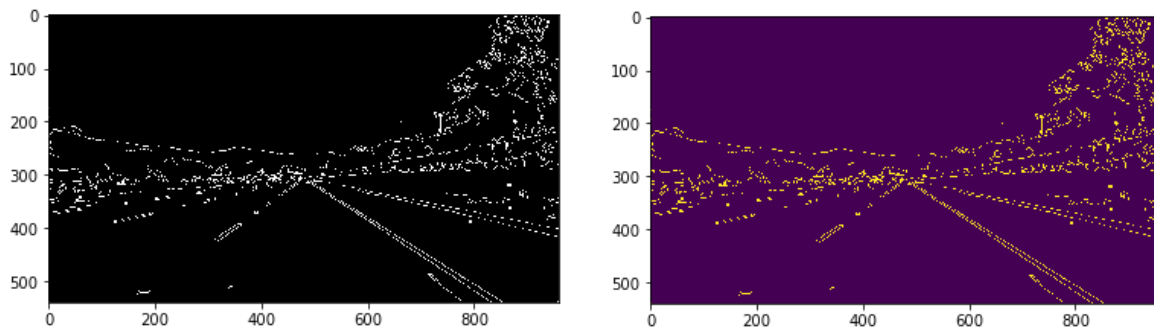
My pipeline consisted of 5 steps. First, I converted the images to grayscale, then applied gaussian smothing applied for grascaling.



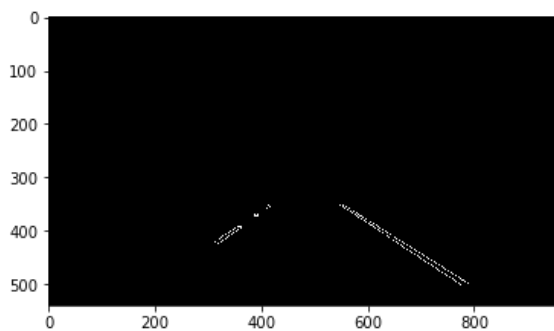
(Fig-1 : Grayscale Conversion – Input Image)



Second, canny detection algorithm applied to find edges (in test images). Third, create a region of interest in image to process by putting “left and right marker” of vertices in image for further processing to do “masking of area”. Canny edges image passed to function `[vertices_shape(edges1)]` to get vertices for region of interest `[region_of_interest(edges1, vertices)]`.



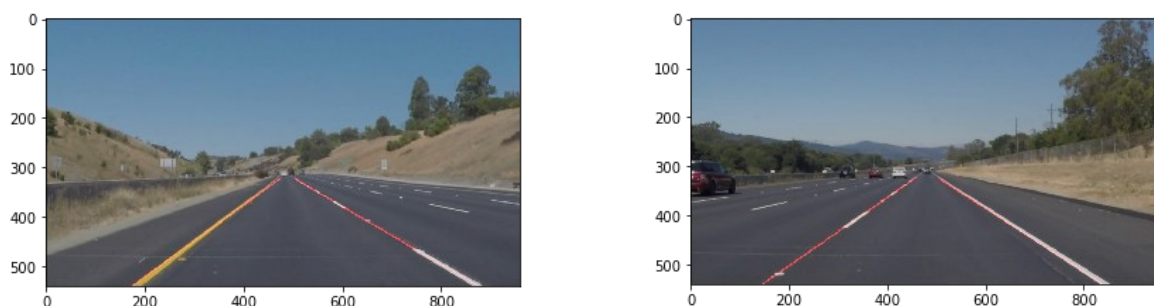
(Fig-2 : Canny edges detection)

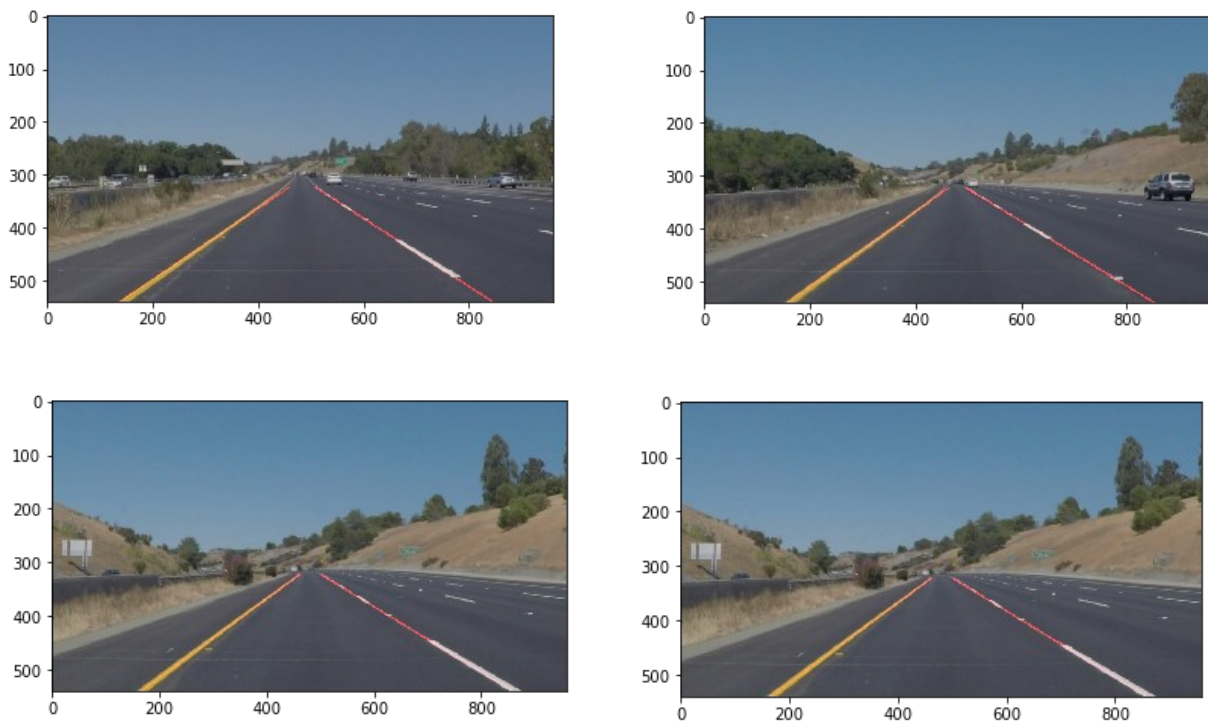


(Fig-3 : Hough Transformation)

Fifth, set parameters for hough transformation, applied on masked image – result shown above. `lane_lines_pipeline()`, an aggregated function applies mentioned set of five functions primarily to identify lane lines in region of interest (Fig-3).

In order to draw a single line on the left and right lanes, I modified the `draw_lines()` function, First by identifying parameters used and initialize them (6 in numbers). Second, identify lines slope (left and right) and compared with a threshold value. Reiterate same process for all lines thereafter applied linear regression for best fit lines. (Outcome highlighted)





## 2. Identify potential shortcomings with your current pipeline

One potential shortcoming would be what would happen when? Images backdrop changed. In program, different thresholds and algorithmic parameters are are hardcoded and fit as per situations. This is the biggest learning of this project (module)

Another shortcoming could be functions could be structured efficiently, sub function tried by me (draw\_line etc) could be implemented and managed in better ways

Note: Herein project i took help from other sources and work done by others - in function/logic implementation and paramter tuning.

## 3. Suggest possible improvements to your pipeline

A possible improvement would be to – restructuring functions imlementation

Another potential improvement could be to – reconfigurable parameter tuning