Finding Lane Lines on the Road

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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.

These are my pipeline steps

Create the greyed copy of the image

1. Apply Gaussian Smoothing to the grey image
2. Identify edges – Apply cv2.Canny function
3. Define the area of interest (a polygon) and mask the portions outside the area of interest.
4. Identify the lines in the area of interest (apply Hough's algorithm). Filter out the lines which may not be part of the lanes. Average the scope of the lines forming the lane. Draw the lanes.
5. Superimpose the image with lanes to the original image

In order to draw a single line on the left and right lanes, I modified the draw_lines() function in the following way.

> Find the slope (m) of each line. If slope is positive, there is a good chance that the line is part of the right lane. If the slope is negative, there is a good chance that the line is part of the left lane.

Filter the lines which may not be part of the lanes - Consider only the lines with absolute slope value greater than 0.5

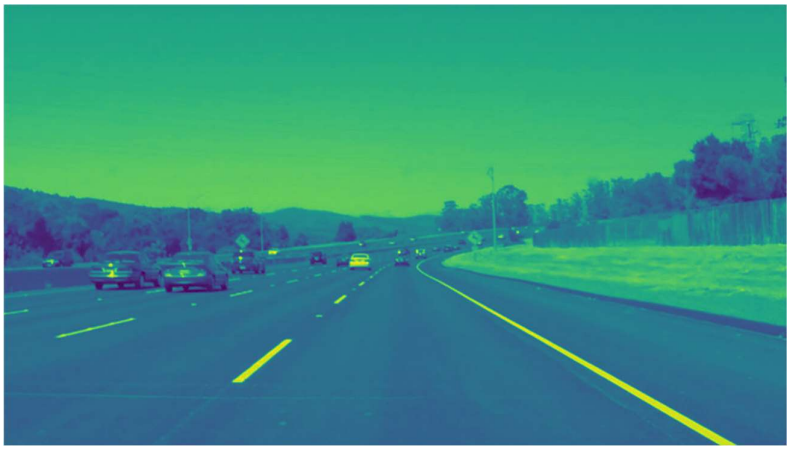
Find the average slope and intercept for the lines part of the right and left lane.

With the average slope and intercept, draw right lane and left lane.

The following images show how the pipeline is applied to the original image.

Original Image

Greyed Image



After Gaussian Smoothing

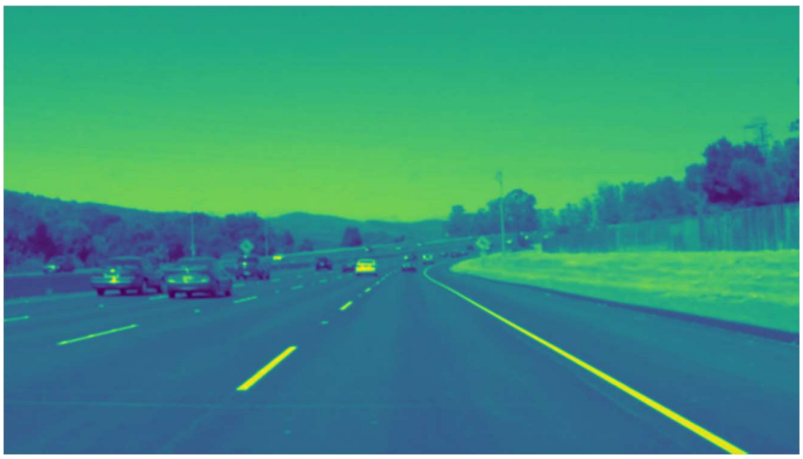
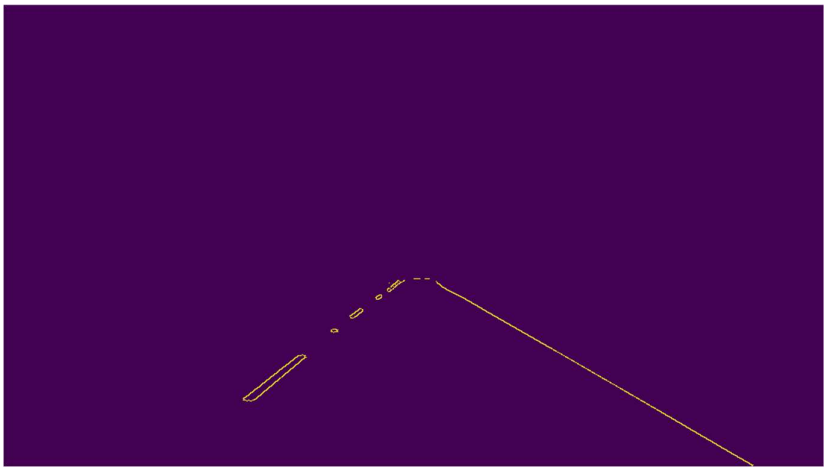
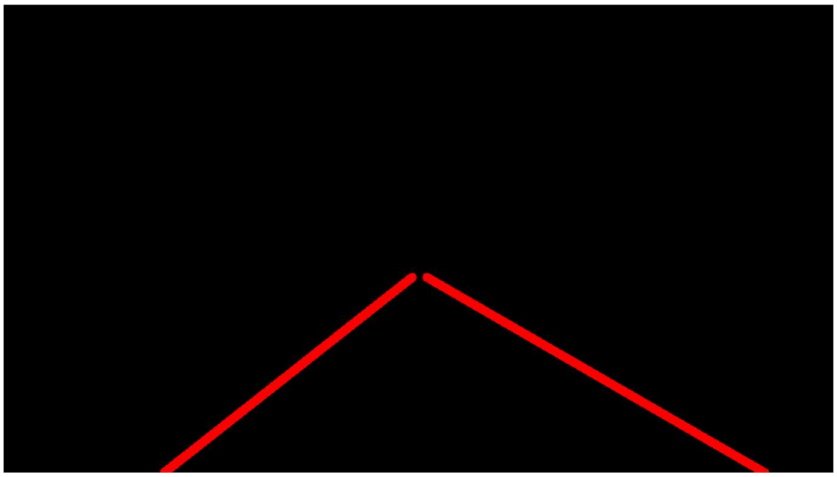


Image with the edges (Apply canny)

After masking (showing only the area of interest)



Identified Lane Lines (Hough)



Original Image with Lane Lines

2. Identify potential shortcomings with your current pipeline

The current pipeline may not identify the lanes properly in curves – The line filtering logic may need change to address this issue.

3. Suggest possible improvements to your pipeline

The current pipeline sometimes picks up lines which are not part of lanes. Need more adjustment for the threshold values used in canny step.

Need to finetune the parameters used for Hough's line finding step.

A better way to identify the lines which are not part of the lanes.