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

Reflection:

The pipeline used to identify lane lines followed a certain number of steps, these steps are written below:

1) A copy of the image is made called copy_image.
2) The image is converted to grayscale and the image is stored as copy_image_gray.
3) The image is then converted into a gradient by, and the result is stored as copy_image_canny.
4) The image is then given into the gaussian blur function, the result is stored as copy_image_blur
5) The image is then given a region of interest we want to focus on, the is stored in copy_region_mask
6) The points are then given Hough lines by converting it into the Hough plane.
7) Finally, the image from the Hough lines function is overlayed onto the original image through the weighted_img function.

In order to connect the lines together, the draw lines function was changed to initially identify lines that are on the left side of the image versus the lines of the right side of the image. This is done by comparing the slopes. Then the x and y points are compared to the points on the horizon and the lines are drawn. **This method did not provide fruitful results.**

In the next method, the goal would be to separate the points into the left and right lane lines, with these points an equation would be created. This equation would be used to identify the y points dynamically given the x points. **This method along with a much stricter parameter tuning gave better results.**

Shortcomings:

The shortcomings with this method are written below :

1) The shortcoming is more evident when the lane curves. This method is a linear equation and will not perform well on curves.
2) The lane lines are shaky and not smooth, these small jitters are another shortcoming of this method .

Improvements:

One improvement that can be made to fix the shortcomings of this solution would be to use more complex polynomial equations to better respond to curves. A better equation can lead to lower error and less jitter.