Finding Lane Lines on the Road

Reflection

1. Description

My pipeline consisted of 5 steps.

1. Conversion of images to grayscale
2. Finding the edges of images with Canny alg
3. Selecting region of interest
4. Finding Hough lines in the selected region
5. Averaging Hough lines into the left and the right one

In order to draw a single line on the left and right lanes, I modified the draw_lines() function by finding the average model y=m*x + b. We can interpret lines as a statistic of this model and then just use np.multipoly function and find models coefficients. Extrapolating is very simple, just use the bottom of image and apex as y for defining x coordinates.

2. Potential shortcomings

My pipeline has such shortcomings:

Edge detection could be a problem if the contrast between road lines and the road is too low. Another problem may occur when the road is contrasted by itself. For example, it has old and new coverage whence such edge gives wrong lane line.

Finding parameters by hand is very slow and gives a bad solution. This step should be optimized.

3. Possible improvements

First problem may be solved by Kalman filter, probably. We need line interpolation between gaps(when line is blinkin) and filter fluctuations of the edges.

We could train our system with ML and find optimal parameters of algs.

Hardcoded apex could be an issue also. Terrain and road curves are constantly changing, the pipeline should adapt to this things.