Software Subsystem

Q2 Lane Marking Extraction and Segmentation

I have written my code in Python using the opencv library to get lanes from the input image.

Firstly I have taken the images using the imshow function. Then I have converted the RGB image to HSV image for better separation of white and yellow colours from the image. I have then taken the ranges of white and yellow colour and then extracted two different layers containing the required colours.

After taking the two mono-coloured layers and the original images together, I went ahead with edge detection algorithms to find out the edges (lanes of the road). First;y, I applied Gaussian Blur on the image to remove unnecessary details from the image. Then I applied Canny Edge detection to detect the edges from the three images. It returned me a binary grayscale image containing all the edges (including lanes and some other unwanted things too).

Then I created a blank array similar to image and manually described a trapezoid selection region according to our camera angle (as image captured, for different camera angles, the dimensions of the trapezoid must be changed. Then I used Binary and function to get edges in the selection region.

After getting edges in the selection region for all three images, I just had to highlight the image. To identify white and yellow images separately, I took the binary and operator of edges in the original image with the edges in white/yellow layer images. This gave me white and yellow edges in the image. Then I highlighted them with separate colours, masked them to the original image, labelled the image and displayed it.

After taking edges in the selection region, I could also have done Hough Transform on the detected edge for correct edge detection, but it is more useful for side lanes. The given image had dotted yellow laned, which were not very correctly detected by Hough Transform. Also the question did not require the equations of line, so i just highlighted the white and yellow layer edges on the main image.