Computer Vision (Spring 2021) Problem Set #2
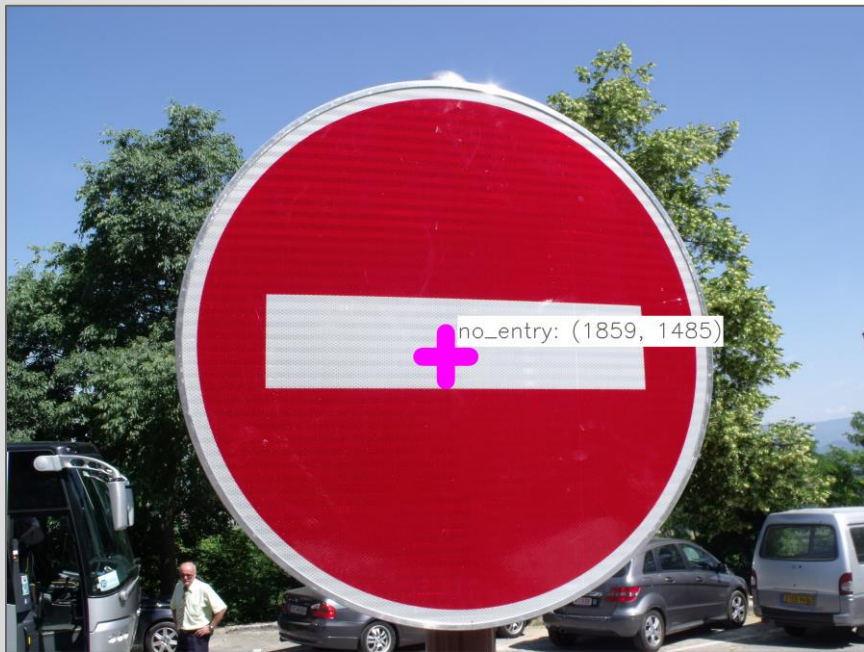
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Challenge problem

no_entry: (1859, 1485)

ps2-5-a-1

Coordinates and Name:
no_entry: (1859, 1485)

Challenge problem

warning: (1854, 1594)

ps2-5-a-2

Coordinates and Name:
warning: (1854, 1594)

Challenge problem

ps2-5-a-3

Coordinates and Name:
warning: (403, 411)

Challenge problem - Discussion

Analyse why using the same function utilized for ps2-5-a-1or ps2-5-a-2 fails to generate good results on ps2-5-a-3 as well. Also discuss the techniques you utilized for recognizing traffic signs in real world images.

The main reason these techniques did not perform well on ps2-5-a-3 is that I spent the time to find specific parameters which work well for both ps2-5-a-1 and ps2-5-a-2. For example, when filtering yellow specifically for ps2-5-a-2, a non-trivial amount of the yellow in ps2-5-a-3 was left out. The technique ultimately used was to apply a Gaussian blur then to use the morphological 'opening' operator. The Gaussian was to help alleviate abnormalities and the 'opening' was to remove possible noise within the image. I then made a HSV copy of the input images. Using the HSV copy, I created colour specific filters, and this allowed me to reduce the search space of the image. I applied the filter to the colour image, then converted that to grayscale. This grayscale image represents the most important parts of the image, so I augmented all pixels with a value greater than 0 to be 255. This makes the features more pronounced and allows easier detection of edges. A similar approach could have been to use a bilateral filter to make the edges more discernible.