1. How do you separate the traffic cone from the background? The image “traffic\_cone.jpg” can be download in the attachment. Use the “Color Threshold” apps include in the MATLAB, choose the appropriate color space, show all the threshold conditions and your result.

Read more about Color Thresholder app: <https://www.mathworks.com/help/images/image-segmentation-using-the-color-thesholder-app.html>



For Python users, you can find out the histogram of the RGB color channels separately by following this:

<https://www.geeksforgeeks.org/opencv-python-program-analyze-image-using-histogram/>

(Optionally), you can also visualize the image in a different color space by:

<https://www.geeksforgeeks.org/python-visualizing-image-in-different-color-spaces/>

After finding the color thresholding values you need, you can filter for the color you need by:

<https://www.geeksforgeeks.org/filter-color-with-opencv/>

1. At the end of the lecture slides, we show an example of how to use HSV filter to highlight the girl’s red dress. The link in problem 1 also provide an example of very powerful MATLAB tool – createMask. Write your own creteMask function that can separate the woman in the red dress (shown below, ‘red\_dress.jpg’ file can be download from the attachment) from the background using HSV filter, include all the code and plot the original image, mask and filtered image.



If possible, I want your results to look like this:

A picture containing chart

Description automatically generated

For Python users, finding the color threshold is very similar to problem 1. Creating a mask can also be found in:

[https://www.geeksforgeeks.org/filter-color-with-opencv/](https://www.geeksforgeeks.org/filter-color-with-opencv/\)

As for the rest, such as converting non-masked area to grayscale and then overlay mask with background, I will leave these for yourself to figure out.