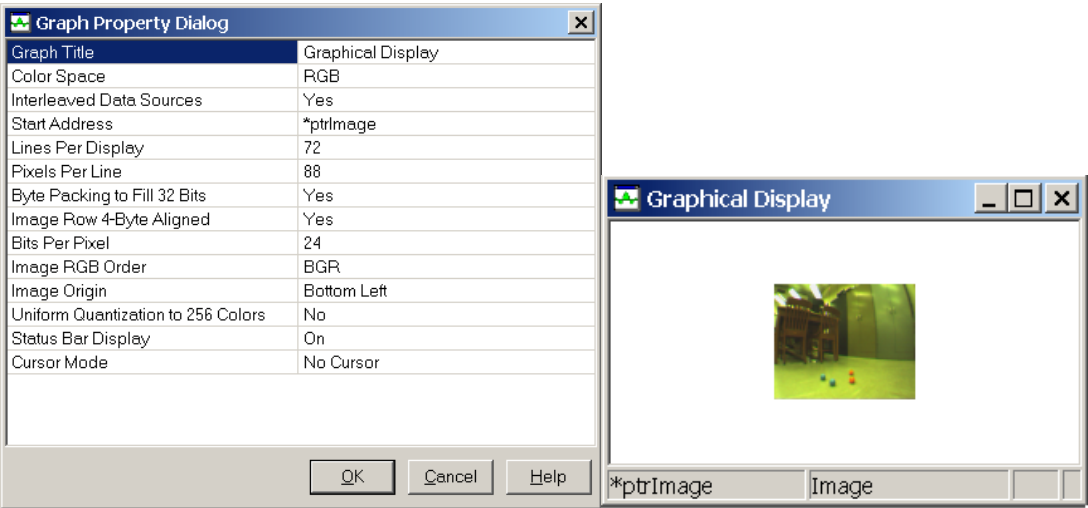


GE423 Laboratory Supplement
How to view images in Code Composer, and using Matlab to tune filters
Useful to find color filter values

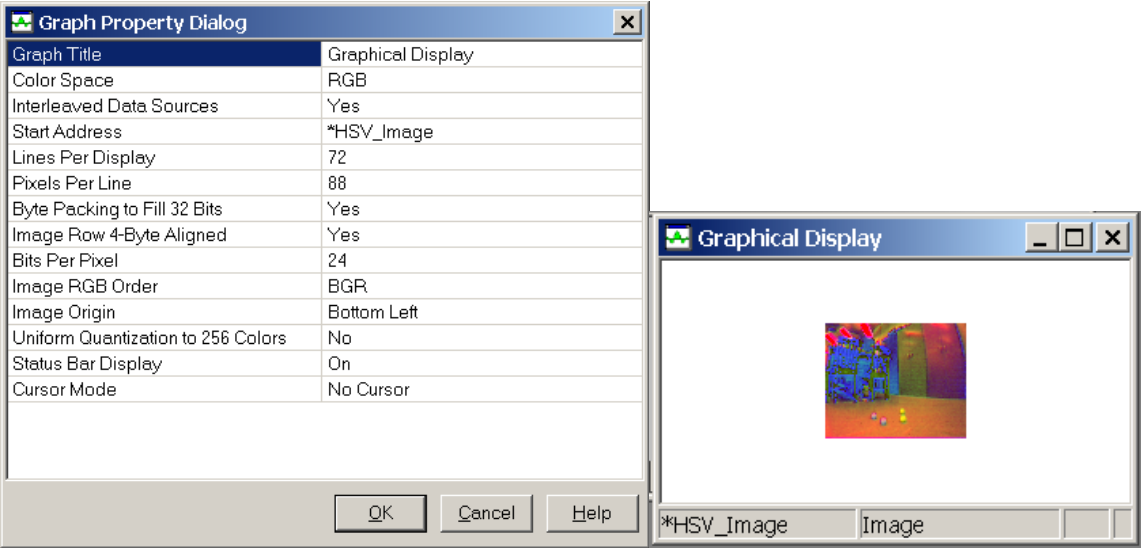
To view RGB images in Code Composer, go to:

- 1) View >> Graph >> Image
- 2) Update the right-hand column of the *Graph Property Dialog* that opens as shown below:



To view HSV images go to:

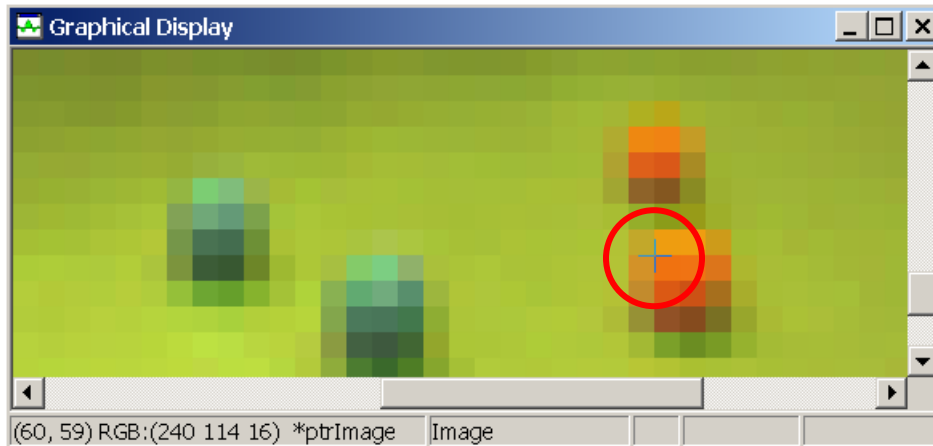
- 1) View -> Graph -> Image
- 2) Click on the dialog box and enter the following settings (note that H is plotted as red, S as blue, and V as green):



NOTE: Start Address is the memory location of the first element of the color image, e.g. *HSV_Image = 0x8001AE20 in the example above. You may type the actual address instead of *HSV_Image if you wish.

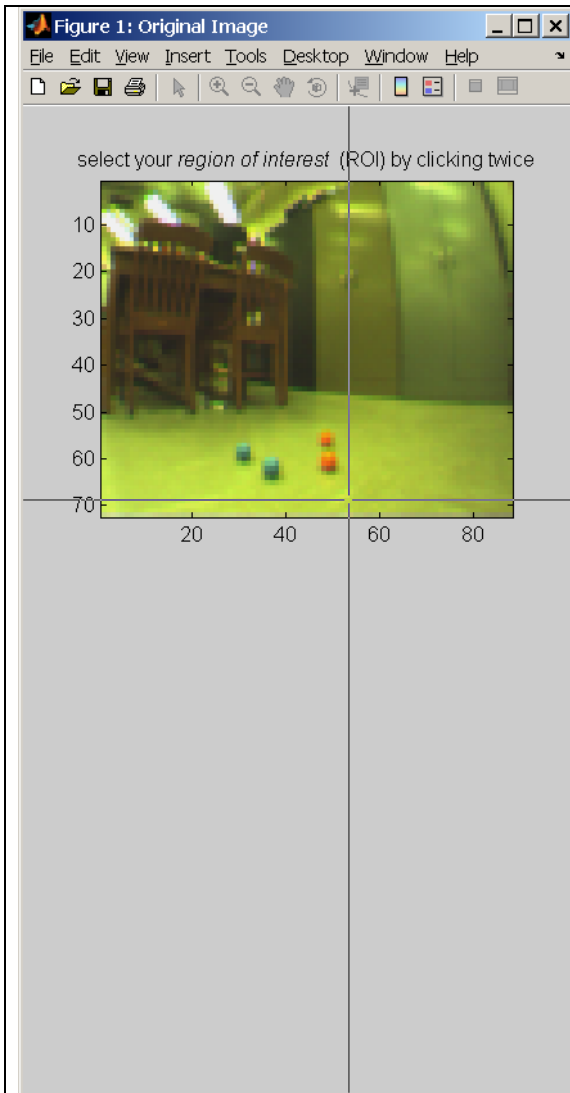
To view RGB (or HSV) values:

- 1) Zoom in by right clicking on the image and select Cursor Mode >> zoom cursor
- 2) Select Cursor Mode >> data cursor to change the cursor to a cross hair. The cursor is on the top left of an orange golf ball below. The RGB values (R=240, G = 114, and B=16) are displayed in the bottom left of the screen. This is helpful for making your color filters



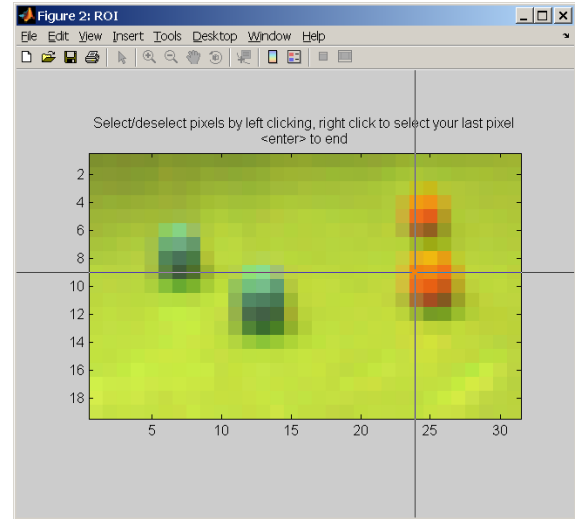
Matlab code for tuning color filters:

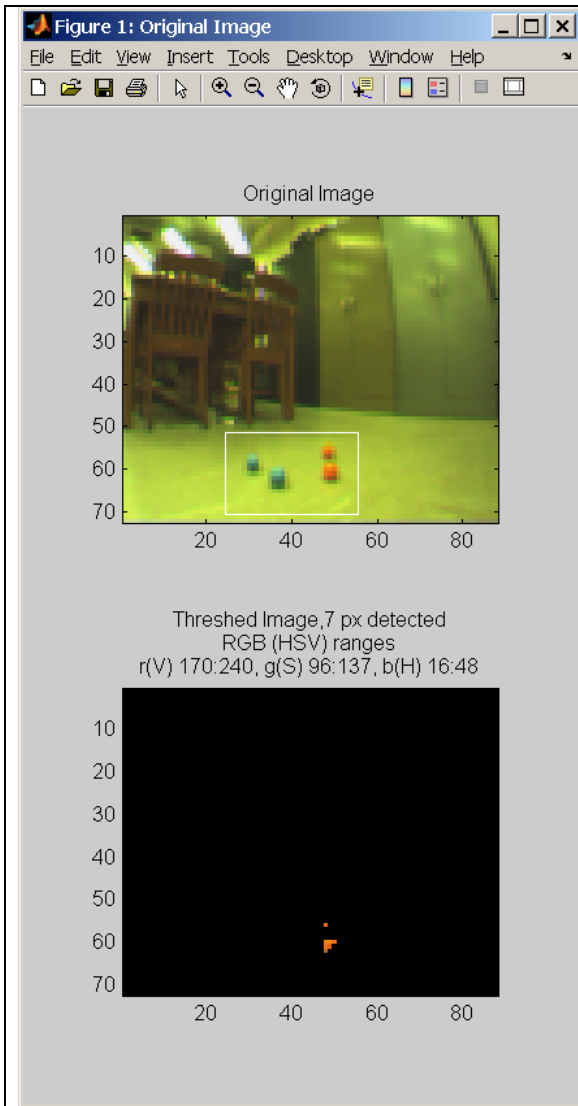
The Matlab file ThreshImagesSim.m is helpful for tuning filters. Save the image from Code Composer by taking a print screen, and copy it into a program like Microsoft Paint. Select and save only the 72x88 pixel image as a .bmp file. Save this file into the same directory as ThreshImageSim.m and run ThreshImageSim.m.



This first screen that opens allows you to select a region of interest (ROI) by clicking two points to define the top left and bottom right of the zoomed in image.

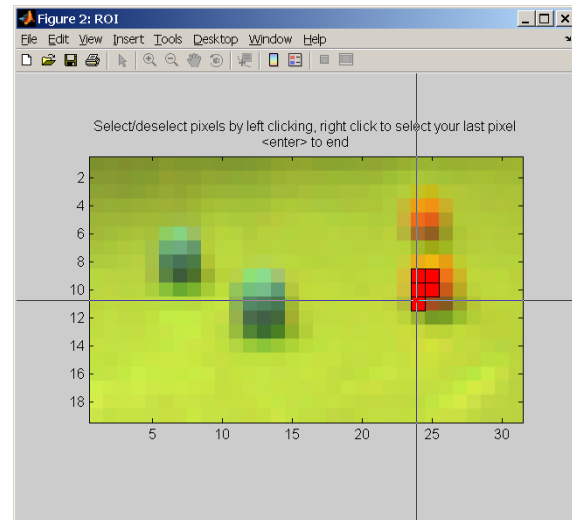
In the next screen you can select pixels by left clicking on them. If you select a bad pixel you can deselect by clicking it a second time

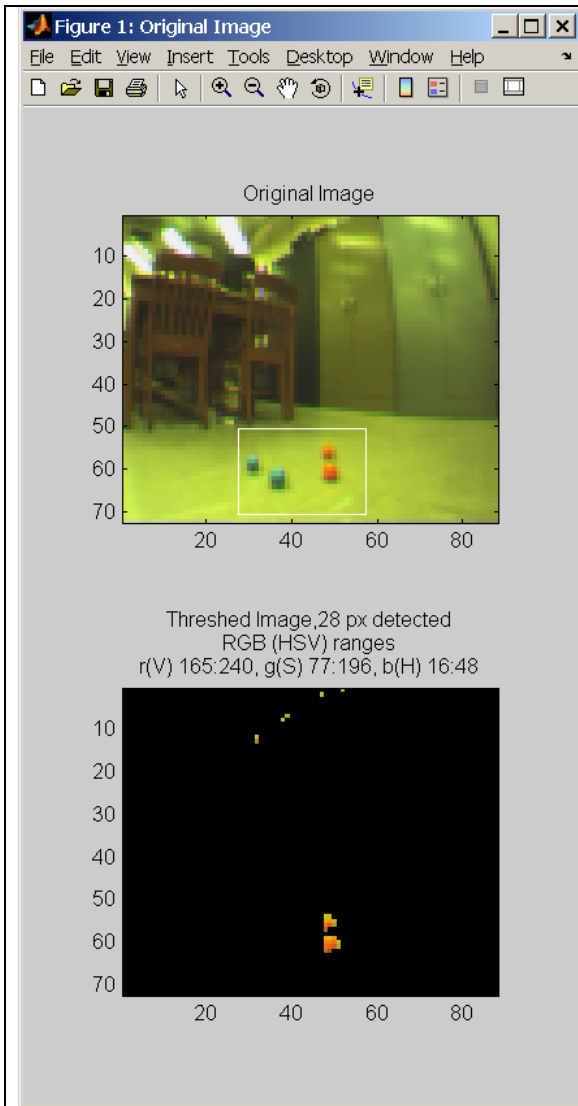




As you select pixels, a thresholded image is generated and you can see the effects of adding and removing pixels. In the bottom left you can see that both orange golf balls are detected, even though only one was used to make the filter

The title of the bottom left graph shows the filter ranges of R: 170-240, G: 96-137, and B: 16-48.





When you are satisfied with your pixel selection and the thresholded image, right click or type <enter> to display a chart of the RGB (or HSV) values. This gives an indication of how the values are clustered. Some objects may require a filter that wraps around – perhaps an H value that includes 0-10 and 200-255.

