

Objective: The objective of this lab sheet is to make sure you can load an image, manipulate the values, produce some output, and make inferences from those resulting images.

1. Reading and Displaying Images:

Read and display the given images "peppers.tiff", "house.tiff". Find the dimensions of each image.

2. Manipulation of Color Images:

- Swap the red and blue pixels of image 1 in problem-1, and display the new image.
- Create a monochrome image (M1g) by selecting the green channel of image 1, and display the new image.
- Create a monochrome image (M1r) by selecting the red channel of image 1, and display the new image.
- Which one of the above two outputs looks more like what you'd expect a monochrome image to look like? Would you expect a computer vision algorithm to work on one better than the other? Justify your answer.

3. Replacement of Pixels:

Take the inner square of 50x100 pixels (that's 50 rows by 100 columns – a horizontal image) of the monochrome version of image 1 in problem-1, and insert them into the monochrome version of image 2 of problem-1. Display the resulting image.

4. Arithmetic and Geometric Operations:

- What is the min and max of the pixel values of M1g? What is the mean? What is the standard deviation? And how did you compute these?
- Subtract the mean from all the pixels, then divide by the standard deviation, then multiply by 10 (if your image is zero to 255) or by 0.05 (if your image ranges from 0.0 to 1.0). Now add the mean back in. Display the resulting image.
- Shift M1g to the left by 2 pixels, and display the resulting image.
- Subtract the shifted version of M1g from the original and make sure that the values are legal (what do negative numbers for pixels mean anyway?).