Project #2
assign May 19   due June 12, 2019

1. (30%) For the RGB color image, *dew on roses (clolr).tif*. (a) Determine and plot the R, G and B-component images (18%). (b) Obtain and plot the color-transformed image by modifying the B-component image using histogram equalization scheme (12%).

2. (50%) Consider the image *airplane in the sky.tif*. Preform the image segmentation by edge-pixel detection + edge linking.

a) Edge-pixel detection (20%): apply the Marr-Hildreth edge detection algorithm to obtain the edge image. Plot all the images generated during the entire step-by-step procedure of applying the algorithm. Assume two thresholds: 0% and 4% the maximum gray level of the image filtered by Gaussian LPF (refer to Figure 10.22).

b) Edge linking by Hough transform (30%): based on the edge maps obtained in a), use the Hough transform to perform *edge linking*.

- Firstly, determine the Hough parameter space using 2° increments for θ and 5 pixels increments for ρ. Make the same plot as Figure 10.31(c) (Example 10.12) (15%).

- From your results of Hough parameter space, determine the cells containing the largest 20 counts to make the same plots as Figures 10.31(d)-10.34(e) (10%).

- Determine the possible cells for the aircraft body (5%).

3. (20%) For the grayscale image, *dew on roses.tif*. Use the multiple global thresholding based on Otsu's algorithm partition the image into three segments.

Dew on roses (color).tif
(512×512)

Dew on roses.tif
(512×512)

Airplane in the sky.tif
(900 × 1200)