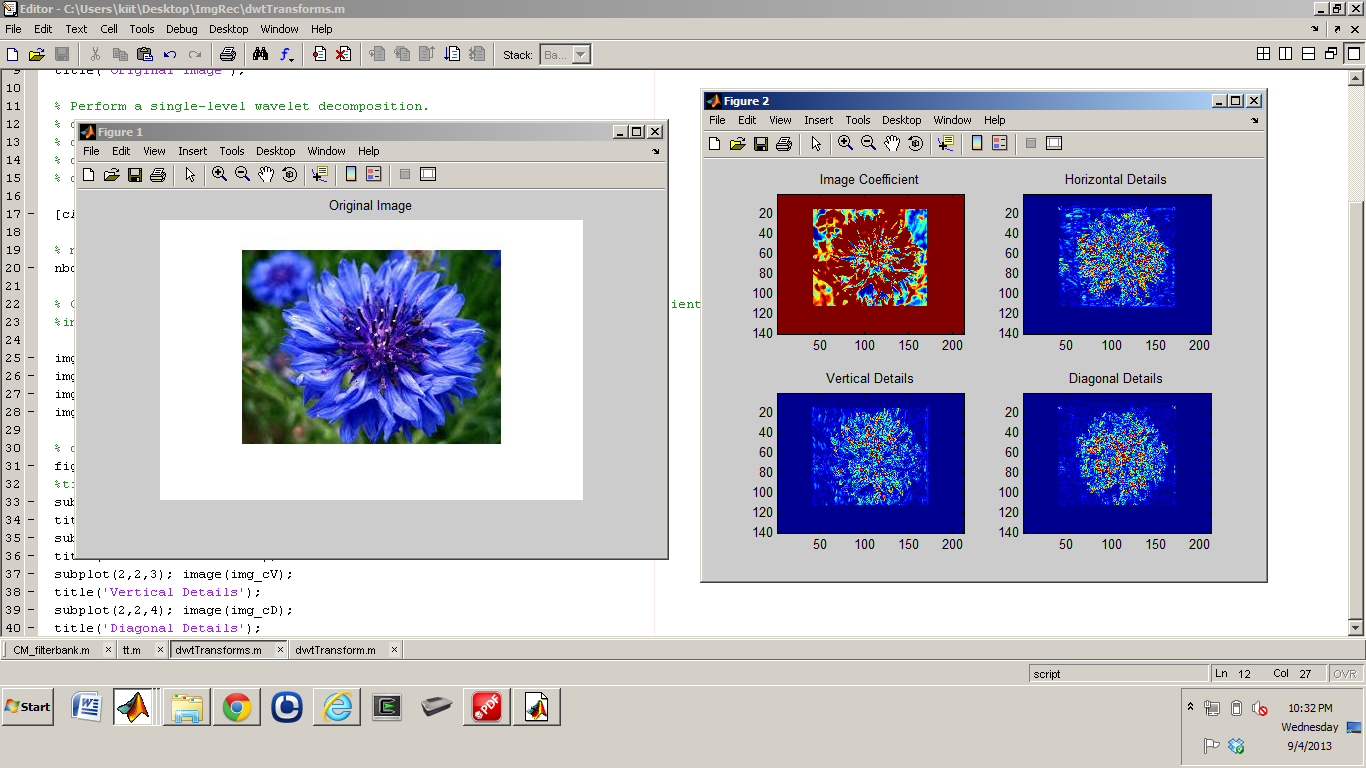
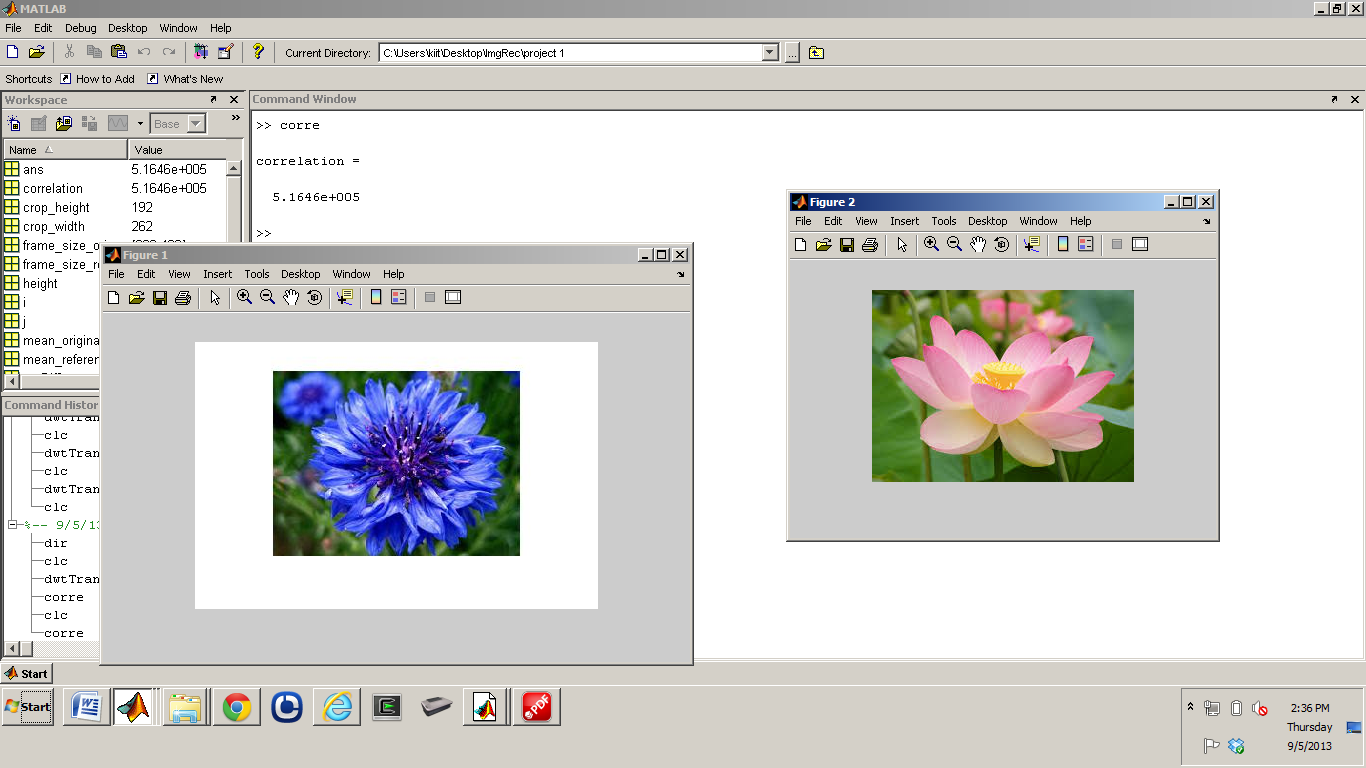
**Screen-shot of the Program output:**

**Program 1: DWT Transform**

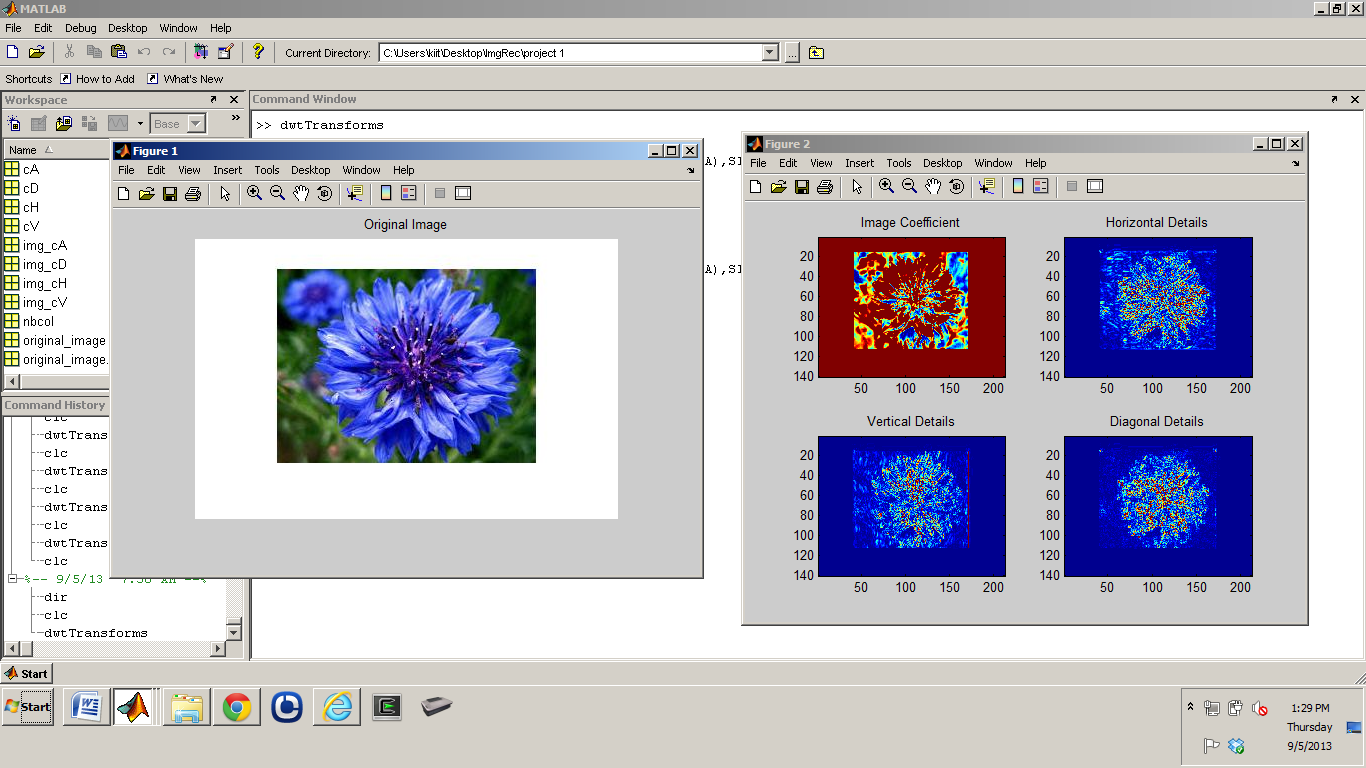


**Program 2: Correlation coefficient of the two images: original image and test image**



Program 1: DWT Transform

Run dwtTransforms.m file



**Code**

**dwtTransforms.m**

clear all

original\_image = imread('original\_image.jpg');

original\_image\_grayScale = rgb2gray(original\_image); % convert image to greyscale

%whos

figure(1);

imshow(original\_image);

title('Original Image');

% Perform a single-level wavelet decomposition.

% cA = coefficients matrix

% cH = horizontal coefficients matrix

% cV = vertical coefficients matrix

% cD = diagonal coefficients matrix

[cA,cH,cV,cD] = dwt2(original\_image,'db1');

% map contains the loaded colormap of the input image

nbcol = size(original\_image,1);

% Construct the one-level approximations and display details from the coefficients

%img\_X = wcodemat(original\_image\_grayScale,nbcol);

img\_cA = wcodemat(cA,nbcol);

img\_cH = wcodemat(cH,nbcol);

img\_cV = wcodemat(cV,nbcol);

img\_cD = wcodemat(cD,nbcol);

% display

figure(2);

%title('1-level Discrete Wevelet Transform Original Image');

subplot(2,2,1); image(img\_cA);

title('Image Coefficient');

subplot(2,2,2); image(img\_cH);

title('Horizontal Details');

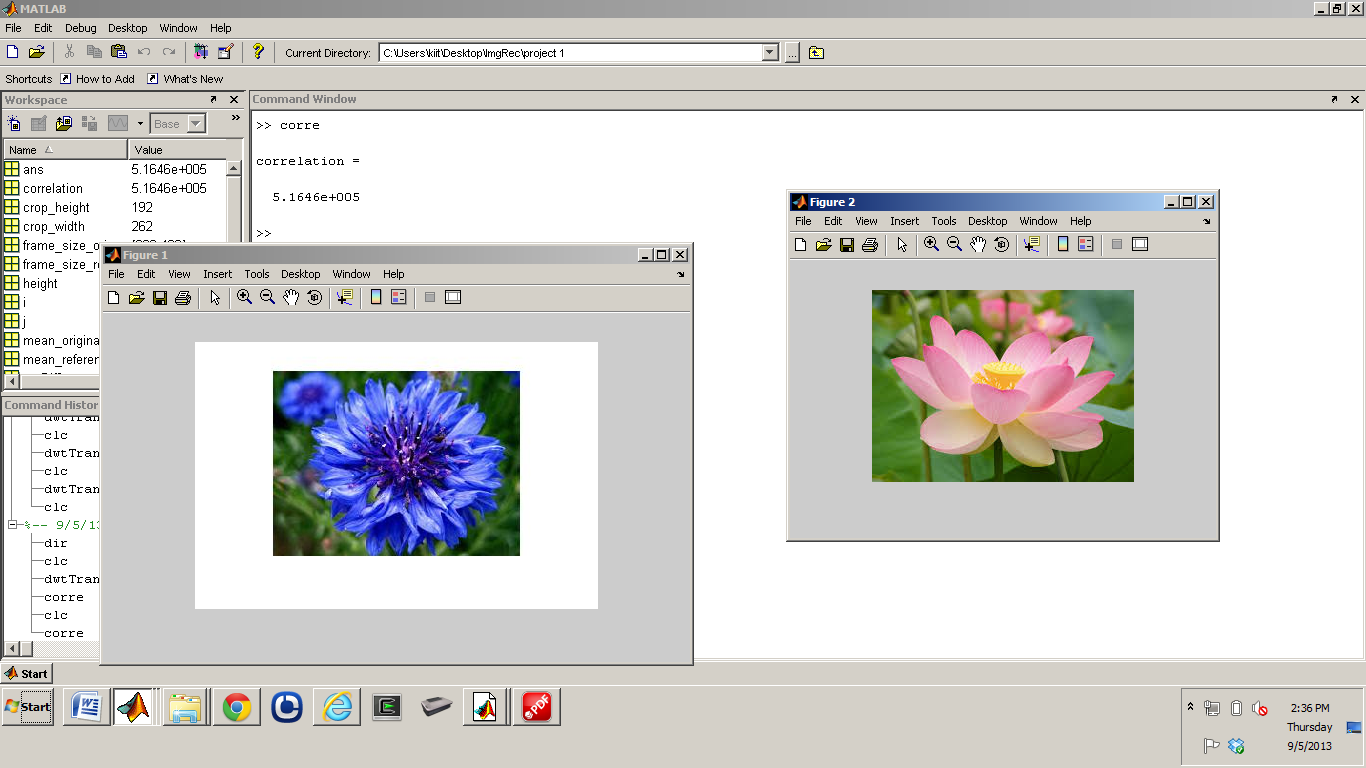
subplot(2,2,3); image(img\_cV);

title('Vertical Details');

subplot(2,2,4); image(img\_cD);

title('Diagonal Details');

Program 2: Correlation coefficient of the two images: original image and test image



**Code**

**corre.m**

clear all

original\_image = imread('original\_image.jpg');

original\_image\_grayScale = rgb2gray(original\_image); % convert image to greyscale

mean\_original\_image = mean(original\_image\_grayScale(:));

reference\_image = imread('test\_image.jpg');

reference\_image\_grayScale = rgb2gray(reference\_image); % convert image to greyscale

mean\_reference\_image = mean(reference\_image\_grayScale(:));

% -- set frame size variables -----

frame\_size\_original\_image = size(original\_image\_grayScale);

width = frame\_size\_original\_image(2); % 259

height = frame\_size\_original\_image(1); % 194

frame\_size\_reference\_image = size(reference\_image\_grayScale);

crop\_width = frame\_size\_reference\_image(2); % 259

crop\_height = frame\_size\_reference\_image(1); % 194

%%%%%%%%%%%%%%%%%

for i = 1:crop\_height

for j = 1:crop\_width

refDiffUpper(i,j) = reference\_image\_grayScale(i,j) - mean\_reference\_image;

refDiffLower(i,j) = (reference\_image\_grayScale(i,j) - mean\_reference\_image)^2;

end

end

refDiffUpper1 = sum(refDiffUpper(:));

refDiffLower1 = sum(refDiffLower(:));

refDiffLower2 = sqrt(refDiffLower1(:));

for i = 1:height

for j = 1:width

orgDiffUpper(i,j) = original\_image\_grayScale(i,j) - mean\_original\_image;

orgDiffLower(i,j) = (original\_image\_grayScale(i,j) - mean\_original\_image)^2;

if orgDiffLower(i,j) <= 0

orgDiffLower(i,j) = 1;

end

end

end

orgDiffUpper1 = sum(orgDiffUpper(:));

orgDiffLower1 = sum(orgDiffLower(:));

orgDiffLower2 = sqrt(orgDiffLower1(:));

% refDiffUpper1;

% refDiffLower1;

% refDiffLower2;

% orgDiffUpper1;

% orgDiffLower1;

% orgDiffLower2;

correlation = (orgDiffUpper1 \* refDiffUpper1) / (orgDiffLower2 \* refDiffLower2);

correlation

imshow(original\_image),figure,imshow(reference\_image)