**Lab06 Tasks:**

Examples shown here can be used as guidelines for different programming languages.

As shown below, some of these tasks are given and ready to use in your code (tasks 5, 7, and 8).

1. Read the images. I1 for US\_Cellular.jpg and I2 for facebook.jpg.
2. Find 4 corresponding corners.

You may use the MAT file (given on Canvas). You can load the MAT file “pts.mat” which contains all the points you need. You may copy these points to another file you use with different programming language.

1. Display the points on the big image for verification. Use the unction rectangle (OpenCV or MATLAB) with blue color.
2. Transform image 2 to image 1; *i.e.*, find the transformation T21.

For example, the MATLAB function “fitgeotrans” with 'projective' we used in the lecture examples.

* Take the pairs of control points, movingPoints and fixedPoints, and use them to infer the geometric transformation specified by transformationType.
* fitgeotrans is not recommended (**but you can use it in this lab**). In future practical work, you may use the fitgeotform2d function instead.

1. Now the new picture is in the right place to replace the old picture.

In the example we used:

I2warp = imwarp(I2, T21, 'OutputView', imref2d(size(I1), [1 size(I1,2)],[1 size(I1,1)]), 'Interp', 'cubic');

1. Display the replacing image.
2. We need to create a polygon mask for the area of the photo.

Iphoto = poly2mask(Pts1(:,1), Pts1(:,2), size(I1,1), size(I1,2));

Ibackground = ~Iphoto;

% Also for the background

% The masks should be the same type as the input image.

Iphoto = uint8(Iphoto);

Ibackground = uint8(Ibackground);

1. Combine the two pictures: RGB image

Icombined(:,:,1) = I1(:,:,1) .\* Ibackground + I2warp(:,:,1) .\* Iphoto;

Icombined(:,:,2) = I1(:,:,2) .\* Ibackground + I2warp(:,:,2) .\* Iphoto;

Icombined(:,:,3) = I1(:,:,3) .\* Ibackground + I2warp(:,:,3) .\* Iphoto;

1. Display the result picture.