



Using the MATLAB software package perform each of the following tasks:

1. Solve Q6 and Q7 of Assignment No.1 by employing the MATLAB functions **cp2tform** and **tformfwd**.

cp2tform

TFORM = cp2tform (input_points, base_points, *transformtype*) takes pairs of reference points and uses them to infer a spatial transformation. input_points is an m -by-2 double matrix containing the x - and y -coordinates of reference points in the system one want to transform. base_points is an m -by-2 double matrix containing the x - and y -coordinates of reference points specified in the base system. *transformtype* specifies the type of spatial transformation to infer. Some supported transformations are 'nonreflective similarity', 'similarity', 'affine' and 'projective'.

tformfwd

Transformed_Data = tformfwd (TFORM, Data) applies the 2D spatial transformation defined in TFORM to the matrix Data yielding the matrix Transformed_Data. Data is an n -by-2 double matrix containing the x - and y -coordinates of points in the system you want to transform.

2. Solve Q4 of Assignment No.3 utilizing the MTLAB function **normxcorr2**.

normxcorr2

C = normxcorr2 (template, A) computes the normalized cross-correlation of the matrices template and A. The matrix A must be larger than the matrix template for the normalization to be meaningful. The resulting matrix C contains the correlation coefficients, which can range in value from -1.0 to 1.0.

3. Given below the pixel coordinates of five points in the left image of the stereo-pair of Lab. No.1. Given also the approximate pixel coordinates of their conjugates in the right image. Determine their correct pixel coordinates using the MTLAB function **normxcorr2**.

| Point No. | Left Coordinates | | Right Coordinates (Approximate) | |
|-----------|------------------|------|---------------------------------|------|
| | c | r | c' | r' |
| 1 | 2535 | 3535 | 337 | 3502 |
| 2 | 2740 | 961 | 516 | 938 |
| 3 | 3752 | 1787 | 1537 | 1754 |
| 4 | 4684 | 932 | 2439 | 907 |
| 5 | 4765 | 4437 | 2585 | 4413 |