Kasetsart University
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Lab 10 Control Point Registration

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Control Point Registration

This method allows you to manually select common features in each image to map to the same pixel location.

Input:

Year 1

Reference image: `image_054_year_1.png`

Year 2

Moving image: `image_054_year_2.png`

Workflow:

Step1 Load input images and convert to grayscale (using function **`rgb2gray()`**).

Step2 Manually select pairs of corresponding control points in both images using the Control Point Selection tool using function `cpselect`

```
[movingPoints,fixedPoints] = cpselect(moving_image, reference, 'wait', true)
```

Step3 Estimate transformation using function

```
tform = fitgeotform2d(movingPoints,fixedPoints,transformationType)
```

Step4 Create three different output views for the image and transformation.

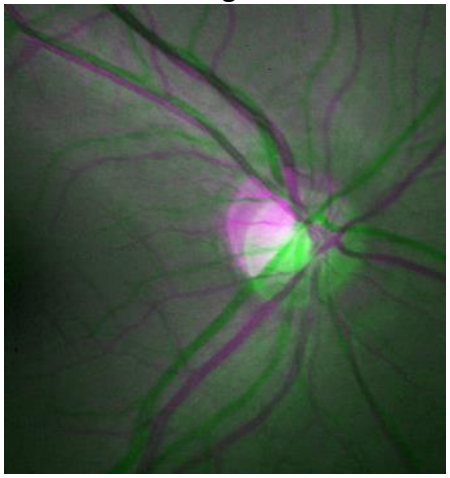
```
sameAsInput = affineOutputView(size(moving_image),tform,'BoundsStyle','SameAsInput')
```

Step5 Recover the original image by transforming the distorted image using function

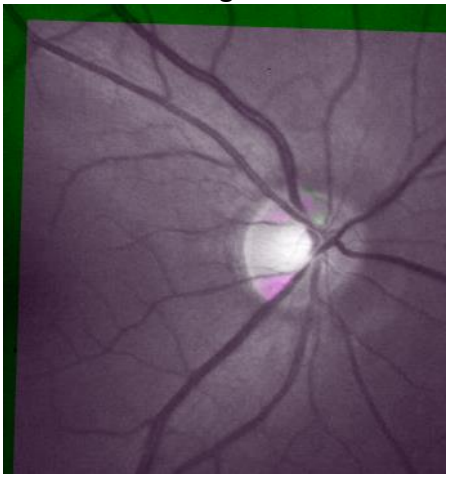
```
B = imwarp(moving_image,tform,'OutputView',sameAsInput)

imshowpair(reference,B) or imshowpair(reference,B,'diff')
```

Output:

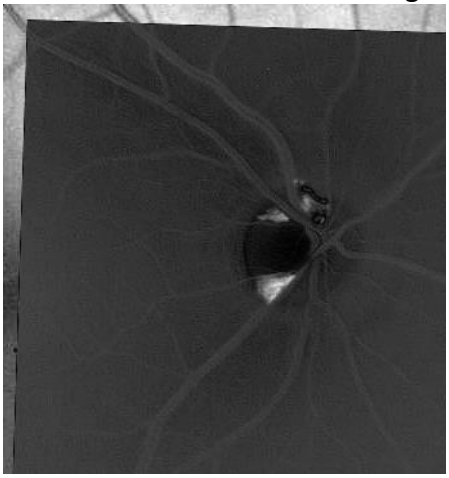
Before registration



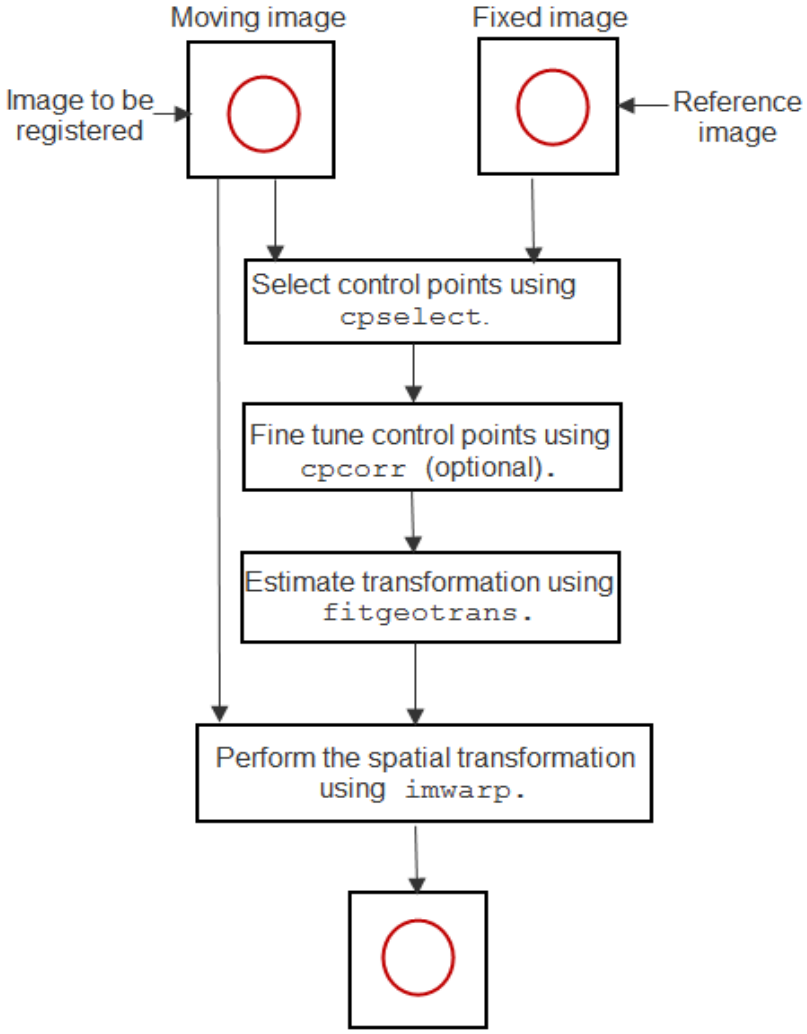
After registration



The difference between two images



Acknowledgement: Test image taken from DRIONS-DB © 2008 by Julián García Feijoo, Jose María Martínez de la Casa, Hospital Miguel Servet, Mariano Rincón Zamorano, Margarita Bachiller and Enrique J. Carmona Suárez.



MATLAB functions	Example
`tform = fitgeotform2d (movingPoints,fixedPoints,transformationType)`	Fits a linear geometric transformation of type transformationType to the control point pairs movingPointsand fixedPoints. transformationType — Type of linear transformation specified as "similarity" | "reflectivesimilarity" | "affine" | "projective"
`imshowpair(A,B,method)`	Compare differences between A and B images. Visualization method to display combined images, specified as one of the following values. "falsecolor" | "blend" | "diff" | "montage"