UNIVERSITY OF WISCONSIN-MADISON, COMPUTER SCIENCE DEPARTMENT

CS767 - Assignment 3

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1 PROBLEM 1

I use Mutual information based registration to finish doMutInfoRegistration() method. calcMI() method is used to calculate the mutual information of im2 and result of im1 after rotate a certain angle. In method, fminsearch is used to find the min results.

$fminsearch(@(k)calcMI(im1, im2, k), initialGuessAngle, options)$

And the option is set to 100 to prevent the program from running too long.

$options = optimset('MaxIter', 100);$

The results are shown in Figure 1.1 and Figure 1.2. The best rotation angle for Figure 1 is -45.3442 and -24.9990 for Figure 2.

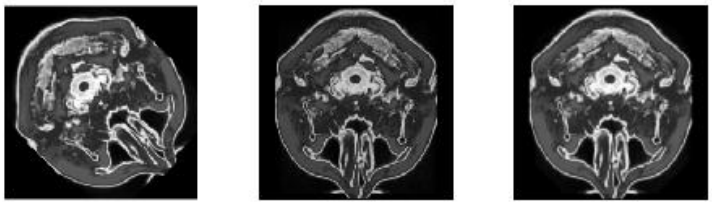

Figure 1.1: Result for Mutual information based registration

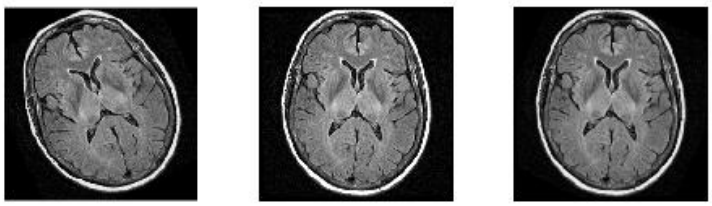

Figure 1.2: Result for Mutual information based registration

2 PROBLEM 2

Use normxcorr2() method to calculate the correlation of two images. The result for example is:
xpeak = 134
ypeak = 118
scale = 0.5060
(134, 118) is the bottom right corner of the small image. 0.5060 is the scale of the small image.

3 PROBLEM 3

I use a 15 * 15 non-overlapping regions to detect the optical flow. Use the best fit algorithm from the class to get the u and v for each region.
The result for example image is shown in Firgure 3.1.

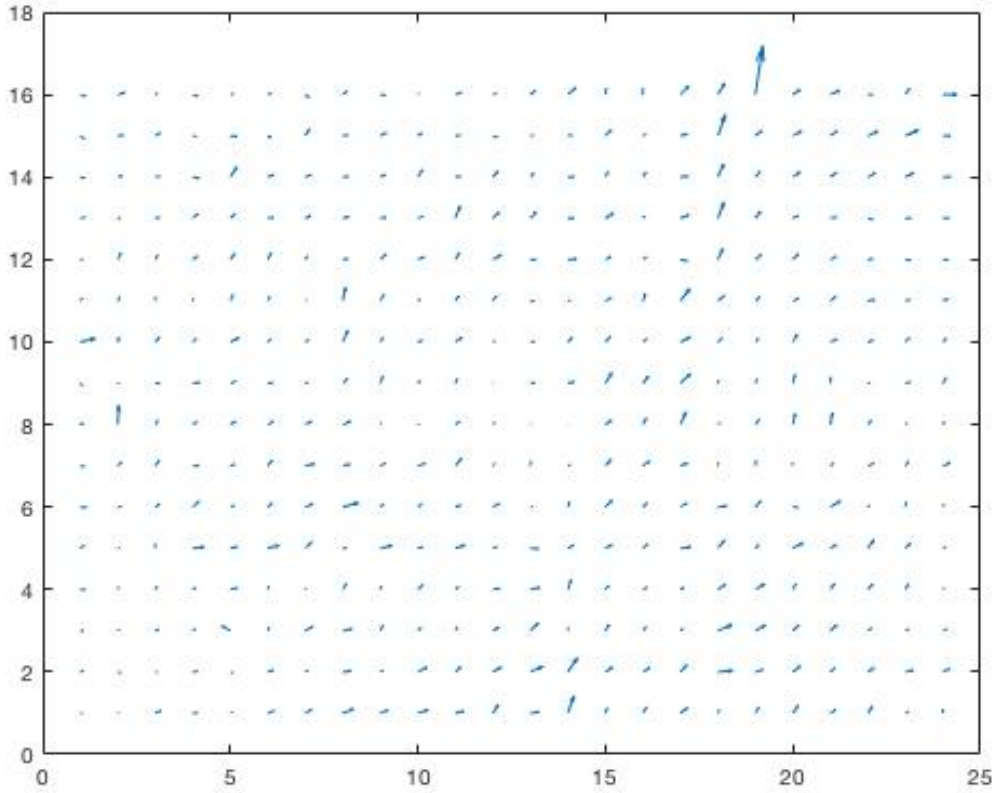

Figure 3.1: Optical flow