Biomedical Image Investigation: Fall 2020

Homework 8

Due: **12/09 AM 9:10**

Two pictures of the same scene are given in the compressed file, one looks ordinary (HW8_fix.mat) and the other (HW8_warp.mat) is deformed.　In order to align these two pictures, you need to find a mapping function between the two pictures based on some common feature points.

(1) Display at least 5 features you are going to use. They all can be points, but they must be located separately in the images. Different features are encouraged.

(2) Show your result with these two pictures aligned and combined as one single scene.

(3) Finally, explain what kinds of transformation may be applied to distort the provided picture. (Hint: An affine mapping may be used to approximate the unknown mapping function.)

BONUS

In the compressed file, you can also find another two *.mat files, Itof and Irad.　They are brain images acquired by different MR techniques, giving high intensities in the superior sagittal sinus (SSS).　Do you think mutual information can be beneficial for the identification of matching regions (i.e., SSS)?　If yes, display the detected points or features with them overlaid on both images.　If not, explain the possible reasons failing feature matching.