

CEG790-2 Medical Image Analysis

(20 points)

Assignment 2

February 7, 2008

In this project we will implement an image registration program. Assuming the images to be registered are in the same modality, are of the same patient taken at different times, and have negligible rotational differences, we want to determine the three translational parameters needed to register the images.

Develop a coarse-to-fine algorithm to find the translational parameters. Reduce size of images by factor of 2 and again by factor of 2 to create images at 3 different resolutions. Find the translational parameters on at the coarsest level first. Then, refine the parameters using the finer and finer images.

After finding the translational parameters, resample the target image to register with the reference image and subtract intensities of registered images. Finally, display the difference image.

Rather than using the entire target image in the search, use the central half of the image. This will not only speed up the process, it will simplify the implementation as it does not require treating the image boundary specially.

Compress all your program files into a single file and attach the compressed file to an e-mail and send to agoshtas@wright.edu by the date and time shown below.

Alternative project: Study the paper by G. Penney, et al. "A comparison of similarity measures for use in 2D-3D medical image registration," *IEEE Trans. Medical Imaging*, vol. 17, 1998, 586–595, and write a report summarizing the contents of the paper.

Due February 26, 2:00 PM