Meeting minutes 2

Wednesday 02/23/2011

Attending: Ben, Murat, Ceylan, Terry

Murat and Ceylan have been working on running the pipeline with sample pelvis data.

We discussed paper F Ding, WK Leow, S Wang. "Segmentation of 3D CT Volume Images Using a Single 2D Atlas". The process outlined in this paper consists of 3 steps:

1. Global transformation: Extract contour of target image, then use ICP for registration

2. Iterative local transformation: Find the most similar IDD (intensity difference distribution) in a neighborhood on the normal to the contour at a given point, then apply the transformation to the whole contour

3. Atlas contour refinement (Local deformation): Use active contour (snake algorithm with Gradient Flow Vector)

Limitations of this process:

If using several 2-D templates, how do you decide which template to use for each slice of the patient data?

For our purposes, using only one 2-D template might not give accurate results, since the bone structure is different in the knee region.

We also made note of the similarity index (Dice coefficient) that was used to evaluate the accuracy of segmentation:

$$S = 2 \frac{|A \cap B|}{|A| + |B|}$$

where A is the set of pixels of the body part in the target image and B is that of the segmented region.

Next week, we will be discussing the paper: A. Yezzi, L. Zollei, T.Kapur. "A variational framework for integrating segmentation and registration through active contours."