Image Registration
Final Project
Due: August 17th, 2009
Team size: 2 persons

Assignment

For the final assignment in this course you are to chose a topic in image registration, find and carefully read at least 3 **different** but related papers[1] that address this topic, and write a 10-15 page paper (double-spaced) that

- Describes the problem(s) being addressed in the papers,

- Summarizes the approaches, key ideas and algorithms presented,

- Compares the algorithms, their implementations, and their results (including perhaps their method of validation), and

- Presents and briefly evaluates your own new ideas for improving upon what has been described in the papers.

Your write-ups should be clear and concise. Include figures to illustrate techniques and ideas. I understand that your own new ideas will not be mature and may only be incremental, but I want to see some evidence that you've tried to develop something new on your own and that you've considered the quality of what you have developed.

Finally, when reading papers you may need to find additional, earlier papers in the literature to help you understand some of the ideas and discussion. Thus, you must have at least 3 key papers on a topic, but as many more additional papers as you need. Your write-up should include references to all of these papers.

Dates

- On Monday, August 17th, be prepared to present a 20-minute summary of the topic you have worked on for your final project. Have your file in a USB removable disk.

- The final paper is due on Monday, August 17th, 11:59pm.

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[1]By different I mean not incremental variations on an idea published by the same research group.

Topics

There are many, many possible projects. Here is a brief brainstorm on some ideas:

- Inter-subject brain registration

- Validating registration

- Registering and combining multiple range images

- Combining range images and video

- Spatial data structures for registration

- Deformable registration using mutual information

- Other information-theoretic measures for registration beyond entropy and mutual information.

- Mutual modality registration outside the medical imaging literature.

- Registering 3D CT volumes with xray images.

- Registration as the basis for building an anatomical atlas.

- Algorithms that combine intensity-based and feature-based methods.

- Algorithms that combine registration and segmentation.