

Medical Imaging Applications: Three Case Studies

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Abstract

We report in some detail the activity of our laboratory related to: microarray image analysis, segmentation of 3D computed tomography imagery, breast shape analysis. Some of these results are being validated by people working in the related fields of expertise, such as the surgeons of the Istituto Nazionale dei Tumori in Milan, Italy.

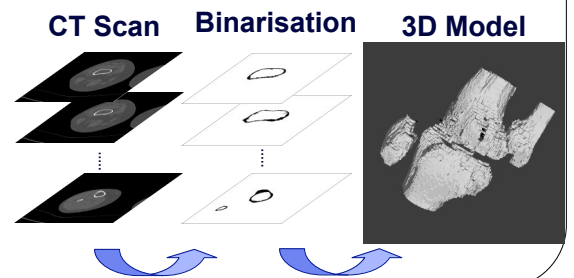
Segmentation and Modelling of CT Data

Requirements:

- 1) Bounding/measuring segmentation error;
- 2) Exploiting intrinsic structure of 3D data;
- 3) Time efficiency / low memory;
- 4) Statistical modelling of knee CT data;
- 5) Minimum and intuitive user interaction.

Segmentation Algorithm:

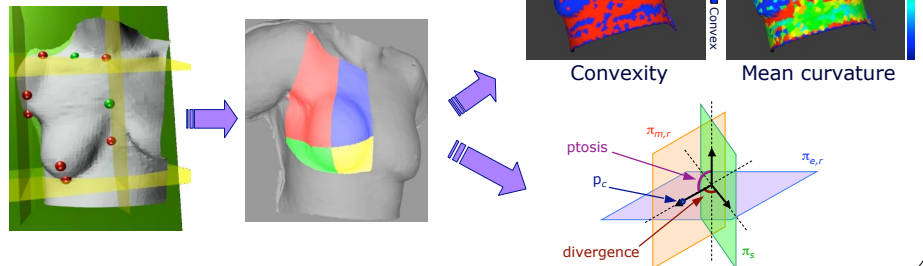
- 1) Pre-Filtering / Enhancing
- 2) Segmentation (SRM)
- 3) Classification
- 4) Validation
- 5) Bone Model



Breast Shape Analysis

Objectives:

- 1) Build a breast partitioning that is
 - 1) Reproducible
 - 2) Reliable and robust
- 2) Compute clinically relevant measures to
 - 1) Objectively evaluate the outcome of surgery
 - 2) Allow data interchange



Microarray Image Analysis

Objectives:

- 1) Segmentation & Classification of Microarray imagery

