Medical Imaging Summer School 2014

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Medical Imaging meets Computer Vision

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Lecture 1: The continuing quest for quantitative image analysis

Medical Image Analysis is a challenging application of Image Analysis that is characterised by:
- Systems that work reliably every time;
- Systems that provide information that is of use to the clinician, who is increasingly drowned in data; and
- Systems that provide quantitative information that informs a diagnosis or therapy response.

We review some of the recent developments we have made in quantitative analysis of disease and its progression in a number of areas, particularly in cancer and liver disease. We particularly emphasise the use, and limitations, of published image analysis algorithms for segmentation, shape analysis, and parts-based registration.

Lecture 2: Shoring up the foundations of image analysis

The Achilles' heel of many image analysis systems is the poor quality of information yielded by early processing. Since this is typically the first step of analysis, limitations at this early stage permeate all subsequent processing. We describe our recent work in: feature analysis; texture measurement; segmentation; and shape matching.