**Glossary**

* **Surface registration –** aligns two set of images so that corresponding coordinate points in the two images reﬂect the same physical location of the scene or 3D volume being imaged
* **Image segmentation** - objects of interest in the image are extracted so that we can analyze their properties
* **Surface reconstruction** - The goal of *surface reconstruction* is to determine a surface *M* that approximates an unknown surface *M*, using a sample *X* and information about the sampling process, for example, bounds on the noise magnitude and the sampling density.
* **Edge detection –** identification of points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities
* **Image reconstruction -** algorithm used to reconstruct 2D and 3D images in certain imaging techniques. For example, in computed tomography an image must be reconstructed from projections of an object
* **Deformable model/active contour –** two kinds: parametric deformable models and geometric deformable models
  + **Parametric deformable model -** energy-minimizing curve to locate boundaries in 2D imagery. The curve is obtained by solving an optimization problem to minimize the sum of an internal energy function, which penalizes curve roughness in the model, and an external energy function which attracts the curve to object boundary
  + **Geometric deformable model** – level set method
* **Adaptive template moderated approaches –** use of a statistical model to guide the detection of objects in an image
* **Split and Merge** – (F. Davoine and J.-M. Chassery) “Start with a small number of points regularly distributed on the image. The split step consists of adding a point on the barycenter of each non homogeneous triangle based on gradient criteria. The split process continues until convergence. Thus it stops when either the triangles are homogeneous or the surfaces of the triangles are less than a given threshold. The merge step consists of deleting neighboring triangles with similar mean grey levels. Those triangles are suppressed from the graph.”
* **Fuzzy Connectedness** – the aim of fuzzy connectedness is to capture the global hanging togetherness using image-based local fuzzy affinity
  + **Affinity** – the closer elements are and more similar their intensities, the greater the affinity between them
* **Edge-based segmentation –** start with a deformable boundary, and attempt to align the boundary with the edges in the image. Generally involves minimizing an energy functional which quantifies the shape of the model and image information near the boundary of the model. e.g. deformable model-based methods, level set method, snakes
* **Region-based segmentation –** assign memebership to objects based on homogeneity statistics.can lead to noisy boundaries and holes in the interior of the object. e.g. Voronoi based, fuzzy connectedness