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Manual segmentation of 3D volume data is still one of the most common ways to produce surfaces of biological structures. This is a time-consuming process that relies on human perception and domain knowledge. Current practices are based largely on an artifact of old 3D image acquisition systems, where in-plane resolution was much higher than inter-plane resolution. This led to manual contouring on a slice-by-slice basis, and subsequent stitching together of the contours to create a surface.

More recent approaches look at the problem of reconstructing from oblique contours. This has the potential to reduce the number of manual contours needed, but leads to interesting questions such as: Can people segment with oblique contours? How many contours are needed? Where should they be placed? If you know the topology of the surface, how can you incorporate this knowledge into the surfacing and contouring algorithms? How do you merge sets of contours? Can you use partial contours?

I will describe a recently developed user interface, Volume Viewer, for creating oblique contours and discuss the implications and open problems for creating surfaces from these oblique contours. (Received September 18, 2013)