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An iterative active contours algorithm applied to heart segmentation

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Abstract

The main goal of this research project is to construct a precise 3-D geometrical model of the human heart. This model would serve for numerical simulations of cardiac activity. Geometrical characteristics are extracted from high resolution medical images such as CT scans. The challenge is to denoise and segment the images. A Total Variation algorithm is used to denoise. For the segmentation problem we use a level set formulation of the Mumford-Shah problem, called active contours without edges. The segmentation is done iteratively. 3-D numerical results based on high-resolution patient CT-scans will be presented.