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An hybrid active contour method for heart segmentation

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The recent increase of computers capacities now allows for realistic simulations of human organ physiology. Such simulations usually require a mesh of the given organ. However, most computations are made on meshes of idealized geometries and there is a lack of realistic and accurate 3D models. We propose a framework to create realistic 3D meshes of the heart from medical images. The segmentation process is done in two steps. First, an improved version of the multi-phase Chan-Vese model is applied to the medical image to obtain a segmentation of the heart's cavities. Second, a geodesic active contour algorithm is applied on the image using information from the first segmentation. This step allows to remove leakings from the first segmentation. All algorithms are parallelized to be applied on large medical images.