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Left-ventricular Epi- and Endocardium Extraction from … Using an Automatically Constructed 3D

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(*Received 00 Month 20XX; accepted 00 Month 20XX*

In this paper, we propose an automatic method for constructing an Acti segment the complete cardiac left ventricle in 3D ultrasound (3DUS) image landmarking. The automatic construction of the ASM has already been however the direct application of these methods to 3DUS is hampered b artifacts. Therefore, we propose to construct the ASM by fusing the multidet data, to learn the shape, with the artificially generated 3DUS, in order to le boundaries. Our artificial images were generated by two approaches: a faster account the geometry of the transducer, and a more comprehensive one, impl The segmentation accuracy of our ASM was evaluated on 20 patients with demonstrating plausibility of the approach.

Keywords: ASM; cardiac segmentation; statistical model; shape model; 3D segmentation

1. Introduction

Ultrasound (US) is known to be the fastest, least expensive and least i the heart. Because of the 3D structure and deformation of the hear cycle, analysis of irregularly shaped cardiac chambers or descriptior 2D images is inherently limited. Developments in 3D echocardiograp (Woo (2009)). During the last two decades it evolved from free-hanc mechanical scanning of several planes using a linear transducer, to mat that are able to acquire a 3D volume of the whole heart almost in rea

The appearance of this new modality brought in new challenges a tools, many of which rely on correct segmentation of the myocardiu artifacts or having a poor window limit the accuracy of such tools. I ity forced many studies to reject up to one third of the data (Nikiti Bellenger, Burgess, et al. (2000)). An extensive survey of traditional a mentation can be found in Noble and Boukerroui (2006); Frangi, Nies Frangi, et al. (2006); Angelini, Homma, et al. (2005); Angelini, Jin a fications of approaches to modeling cardiac geometry can be found i (2001); Frangi, Niessen, et al. (2005).

Let us start with approaches using explicit surface representation. To on a segmentation algorithm, Hong, Georgescu, et al. (2006) propos