

Medical Image Processing

Final Project Proposal

Analysis of Heart's Ultrasound Videos

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Ultrasound 2D-mode video (echocardiography) of the heart is a non-invasive diagnosis widely used to provide an assessment of the health of the myocardium, and as well as it's a useful tool for defining cardiac anatomy and function. In this project we intend to provide an estimation of the anatomy (volume) of the heart; this can be accomplished by measuring the distances between the walls of the right heart's ventricle, and how they change through time.

A 2D-mode echocardiography does not provide directly any time information, so an M-mode is estimated from the 2D-mode. Two techniques are proposed to segment the resulting image: Mathematical Morphology (MM) and the AM-FM transformation. The use of MM is motivated due to the lack of a high noise level in the extracted M-mode when compared to a real M-mode, for which the AM-FM transformation has been successfully used to provide an accurate segmentation.

In order to compare the results of the proposed approaches, both techniques will be used in a real 2D-mode echocardiography to estimate heart's volume. The final implementation will be written in ANSI C; the underlying OS will be Linux.