

LEFT VENTRICLE FUNCTIONAL ANALYSIS FROM CORONARY CT ANGIOGRAPHY

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The heart is a vital organ in the human body. The analysis of the left-ventricle (LV) is of paramount importance to characterize the cardiac function. Coronary computed tomography (CT) angiography is performed by injecting the patient with a contrast agent that will improve visibility of the coronary arteries and heart chambers (atria and ventricles). Even though coronary CT angiography results in 10-12 image volumes, acquired along the cardiac cycle, only three of these volumes are typically used for diagnosis: one, at around 60% of the cardiac cycle, to assess the coronaries, and other two at end-systole (maximum heart contraction) and end-diastole (heart passively filling with blood). Therefore, due to the lack of tools to do it, a large amount of data, which might improve diagnosis, is left out of the analysis.

The methods proposed by Samuel Silva, researcher at IEETA, during his PhD, allow functional analysis of the left ventricle including all cardiac phases, along the cardiac cycle, by using different regional and local measures to characterize LV function (e.g., endocardium radius, myocardium thickness, and regional blood volumes). Furthermore, to allow analysis and comparison of the different measures and anatomical regions, several features are provided including interactive coordinated views of both functional data and anatomy, complemented by animated sequences to enhance abnormalities detection.

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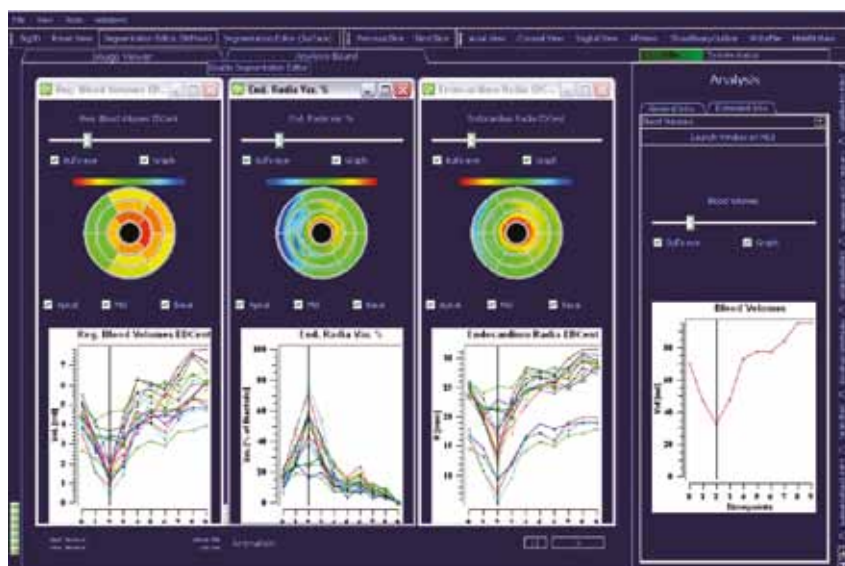


FIGURE 1

Interactive analysis screen showing coordinated views of left ventricle functional data as provided by different measures selected by the clinician (e.g. regional blood volumes).