

ABSTRACT

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THE CALCULATION OF FETAL HEART RATE BASED ON VIDEO ECHOCARDIOGRAPHY EXTRACTION RESULTS

(xiv + 105 halaman: 63 pictures; 6 tables; 1 attachment)

Heart rate is one of the medical medium to diagnose fetal health, so mothers are highly encouraged to check up on their fetal heart rate on regular basis. The medical instrument used to measure fetal heart rate is fetoscope, doppler, and cardiography. Doppler is usually utilized on USG and echocardiography; however, incorrect usage of doppler can endanger fetal condition and development. Therefore, based on the aforementioned dilemma, the solution proposed here is an application which can measure the fetal heart rate through observed changes in the heart region from extracted images of echocardiography video.

Four steps are formulated to obtain the fetal heart rate as sequential processes such as pre-enhancement, segmentation, observation of heart region changes, and heart rate calculation. This application will be assessed with four kinds of tests as follows: functionality test, echocardiography video extraction test, performance test, and heart rate calculation accuracy test.

In order to distinguish the heart section in an image extracted from echocardiography video, it requires binary imaging process of low pass filter with a certain threshold value. From the extraction, the image is manually cropped to one of cardiovascular chambers, which is ventricle, because of both atrium and ventricle contract separately in turns. Heart rate measurement through visual observations is done to test the application's computational result, with estimated accuracy of 88.82% from six video samples. Although this computation method has not been practiced in medical world, it can be still used as an alternative of heart rate measurement.

References : 21 (2006-2014).