PHONOCARDIOGRAM WHICH EQUIPPED OF ARTIFICIAL NEURAL NETWORK WITH FEATURE EXTRACTION USE DECORLET AND ENERGY SIGNAL WAVELET DECOMPOSITION

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ABSTRACT

Auscultation is one of the old method had been used by doctor to analyze heartbeat sound using stethoscope. Beside that, the other technic to analyze heartbeat sound is using phonocardiogram. In this study, planning system has been done to analyzed heartbeat sound using electronic phonocardiogram with feature extraction using decorlet method and energy signal wavelet decomposition and artificial neural network as classification signal. The process analysis signals was started with recording the human heartbeat sound, selection wavelet function, filtering signal, feature extraction signal and classification signal. The processing signals had been done with Matlab 7.8. In this study we used symlet wavelet order 10 as function wavelet analysts which used to feature extraction and filtering signal. Symlet wavelet (sym10) is selected as wavelet analyst because have small error reconstruction compared to other wavelet (doubechies and coiflet). Digital filtering wavelet has reduction capability the random noise with SNR value more than 21 dB. The structure of artificial neural network we have designed consists of 7 neurons input, 7 hidden neurons and 6 neurons output. Artificial neural network can identified Normal, Aortic stenosis, Mitral regurgitation, Aortic regurgitation, Mitral stenosis and Patent ductus arteriosus heartbeat sound with the average success rate is 76 % for method energy signals and 92 % for method decorlet.

Key word : phonocardiogram, energy signal, decorlet