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HRV and BPV neural network model with wavelet based algorithm calibration

G. Postolache [a] ✉, L. Silva Carvalho [c], O. Postolache [b] ✉, P. Girão [b] ✉, I. Rocha [c]

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Abstract

The heart rate and blood pressure power spectrum, especially the power of the low frequency (LF) and high frequency (HF) components, have been widely used in the last decades for quantification of both autonomic function and respiratory activity. Discrete Wavelet Transform (DWT) is an important tool in this field. The paper presents a LF and HF fast estimator that uses artificial neural networks and Daubechies DWT processing techniques. Radial Basis Function and Multilayer Perceptron neural networks were designed and implemented for fast assessment of cardiovascular autonomic nervous system control. The training values to design the networks were obtained after heart rate and blood pressure wavelets processing. The designed neural structures assure a faster evaluation tool of the sympathetic and parasympathetic autonomic nervous system control of the cardiovascular function.

Keywords

Autonomic nervous system; Wavelet transform; Neural network model

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