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RESEARCH ARTICLE

REMOVAL OF NOISE IN PPG SIGNALS USING WAVELETS

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Abstract— Photoplethysmography (PPG) is a non-invasive method of studies of the blood volume pulsations by detections and temporal analysis of the tissue back-scattered or transmitted optical radiation. It provides a quality assessment of changes in cutaneous blood volume. . The recorded PPG signal acquired using PPG sensors are usually corrupted with Motion Artifacts (MA) due to the voluntary or involuntary movements of patient. The identification and elimination of MA has received much attention in the literature over recent years. Traditionally, signal processing for Pulse-Oximeter (PPG waveforms) consisted of a time domain Weighted Moving Average (WMA) of source absorption ratios to compute blood oxygenation. This method however, suffers from in-consistent measurements due to motion artifact which is the Gaussian random noise and fails under low perfusion states in diseased condition. In this work wavelet denoising method is used to remove the motion artifact and found to be the better method compare to the methods used traditionally in pulse oximeter.

Key Terms: - Biomedical signals; PPG; Motion artifact; Wavelet transform; Additive White Gaussian Noise Model (AWGN)

Full Text: http://www.ijcsmc.com/docs/papers/June2013/V2I6201311.pdf