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Low Cost Surface Electromyographic Signal Amplifier Based on Arduino Microcontroller

Authors : Igor Luiz Bernardes de Moura, Luan Carlos de Sena Monteiro Ozelim, Fabiano Araujo Soares

Abstract : The development of a low cost acquisition system of S-EMG signals which are reliable, comfortable for the user and with high mobility shows to be a relevant proposition in modern biomedical engineering scenario. In the study, the sampling capacity of the Arduino microcontroller Atmel Atmega328 with an A/D converter with 10-bit resolution and its reconstructing capability of a signal of surface electromyography are analyzed. An electronic circuit to capture the signal through two differential channels was designed, signals from Biceps Brachialis of a healthy man of 21 years was acquired to test the system prototype. ARV, MDF, MNF and RMS estimators were used to compare de acquired signals with physiological values. The Arduino was configured with a sampling frequency of 1.5 kHz for each channel, and the tests with the circuit designed offered a SNR of 20.57dB.

Keywords : electromyography, Arduino, low-cost, atmel atmega328 microcontroller
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