

## System for Electromyography Signal Emulation Through the Use of Embedded Systems

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**Abstract :** This work describes a physiological signal emulation system that uses electromyography (EMG) signals obtained from muscle sensors in the first instance. These signals are used to extract their characteristics to model and emulate specific arm movements. The main objective of this effort is to develop a new biomedical software system capable of generating physiological signals through the use of embedded systems by establishing the characteristics of the acquired signals. The acquisition system used was Biosignals, which contains two EMG electrodes used to acquire signals from the forearm muscles placed on the extensor and flexor muscles. Processing algorithms were implemented to classify the signals generated by the arm muscles when performing specific movements such as wrist flexion extension, palmar grip, and wrist pronation-supination. Matlab software was used to condition and preprocess the signals for subsequent classification. Subsequently, the mathematical modeling of each signal is performed to be generated by the embedded system, with a validation of the accuracy of the obtained signal using the percentage of cross-correlation, obtaining a precision of 96%. The equations are then discretized to be emulated in the embedded system, obtaining a system capable of generating physiological signals according to the characteristics of medical analysis.

**Keywords :** classification, electromyography, embedded system, emulation, physiological signals

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