

EXPLORING THE EMG SIGNAL WITH THE MYO ARMBAND

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DESCRIPTION

The purpose of this project is to explore the EMG signal using the myo armband. This project will be looking at the challenges that new technologies have overcome in detecting EMG signals. Also exploring the challenges in machine learning and how these signals can be trained and used for gestural control applications. The EMG signal has been around back as far as the 1960's, with its first uses in healthcare. As the signal became more popular in various exploratory programs and valuable research conducted, a widespread field of opportunities was unleashed.

This project will also be looking at the challenges with machine learning, using wekinator and the myo armband. These two technologies along with the EMG signal will be working together to show these challenges during the machine learning process, and some possibilities to overcome them. Machine learning has become quite popular in recent years with the development of new technologies such as wekinator and weka. This project will focus on the process on how to train gestures using wekinator and training data, along with signal processing techniques for the EMG signal.

PROCESS

The system was created using max msp, and the myo armband as the piece of hardware. The system is split up into three different sections which include the recording and storage of the data, data processing and communication between max and wekinator over open sound control (OSC). Three different gestures with over ten variations of each were recorded which were used as training data for wekinator. The myo armband had to be placed in the exact same location on the arm during the whole process.

Various different tests were conducted using multiple signal processing techniques and testing various algorithms for different model types during the training stages of the machine learning process. Tests were conducted to determine the most efficient machine learning process while training with raw, filtered and multiple input data types, and to monitor the difference in behavior and the outputs from the gestures.

