

# **Developing a Mobile Application and Cloud Computing Framework for Gesture Recognition Using Electromyographic and Inertial Measurement Unit Data**

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## **Abstract**

Humans skeletal muscles naturally produce electrical activity by the contraction of muscles. Electromyography (EMG) is the technique of recording and evaluating these electrical activities. EMG Pattern Recognition (PR) is the process of taking these signals and processing them with the intention of classifying human gestures and can be used to control prosthetics, virtual/augmented reality, robotics, and more. EMG PR systems must operate quickly in real time. They must also be accurate, durable and robust in order to be used in practice. EMG PR is data driven, the amount and quality of data determines the success of the process. Proper data storage and processing techniques could allow us to compile data from many users to create one PR model that can be applied to any human. A mobile Android application, paired with the MYO Armband EMG and IMU sensor (Thalmic Labs), was developed as a user friendly and mobile EMG PR solution. The application is aided by Amazon Web Services to store and process large amounts of data. The concept of users is introduced to the application through user registration and login pages in order to store and evaluate user-specific data. This paper discusses ongoing development of the application and experiments conducted evaluating the feasibility of creating a model composed of data from all users.