

## Lab 1

# Processing EMG Data

## 1 Introduction

This document will serve as the specification (“specs”) for the program you are being asked to write. Be glad that none of you are programming for a living, since the specs you usually get are not nearly this nice!

Once you understand what needs to be done, your task is to create a MATLAB function which *implements* the specs you have been given.

Datasets and other files that you need for this assignment can be downloaded from <http://bigiron.atistar.net/~step>.

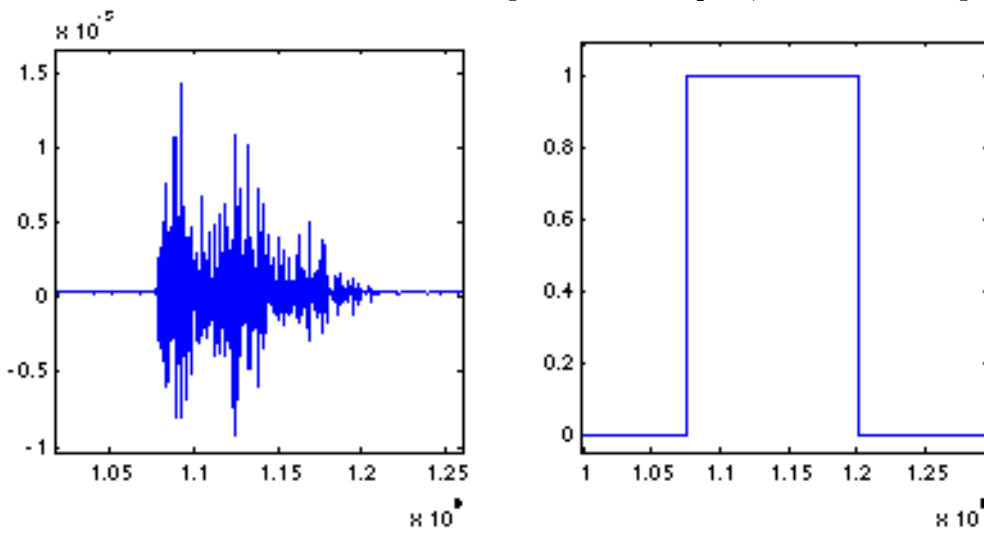
## 2 The Problem

You are given some time series which are data from an Electro-myography (EMG) capture device. You are advised to plot them in order to get a feeling for what they are like.

Assuming you have done so, you will see that they are a little messy.

**Problem:** We have continuous muscle activation, but we want to know when a muscle goes ON and when it goes OFF.

This means that we must turn something like the left plot, into something like the right plot:



## 2.1 Program Specification

Write a function named `process_emg` with *minimally* the following function declaration:

```
function newemgdata = process_emg( emgdata )
```

This function takes a single parameter which is the raw EMG data to be transformed.

Note that I say *minimally* above, your implementation may require additional parameters.

The output parameter, `newemgdata`, is a vector the same length as `emgdata`. It has a value of 1 when the muscle is considered ON, 0 when the muscle is considered OFF.

## 2.2 Implementation

Your function should be saved in a file named `process_emg.m`.

The way your implementation solves the problem is up to you, but if you need to get started just send me an email.

Once you have run your function using several of the sample EMG time series, and are happy with your output, send your `process_emg.m` to me. I'll give you constructive comments and hints on ways to make it better.