EMG Yoga Project Data Collection Documentation

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1 Introduction

This document provides a guide to the data collection process for the EMG Yoga Project, including file organization, data recording, and file renaming.

2 Data Collection Directory

First, create a main directory for the project, let's call it "`EMG_Yoga_project`".

Inside the "`EMG_Yoga_project`" directory, create a sub-directory for each participant trial. The naming convention for these directories is to start with the participant type (for example, "YP1" for the first participant of type "YP"), followed by an underscore, and then a description (like "testing") followed by an underscore and then the trial number.

So, for example, if you have two participants "YP1" and "YT1" both undergoing testing, and participant "YP1" undergoes two trials, your directory structure will look like this:

```
EMG_Yoga_project
├ YP1_testing_1
├ YP1_testing_2
└ YT1_testing_1
```

Within each sub-directory, a README.txt file should be created that explains the mapping between the amplifier channels and the muscles targeted. An example of what this file could look like is:

```
Channel Configurations:
    Channel 1 - Upper Trap (Right side)
    Channel 2 - Middle Trap (Right side)
    Channel 3 - Lower Trap (Right side)
    Channel 4 - Serratus Anterior (Right side)
    Channel 5 - Upper Trap (Left side)
    Channel 6 - Middle Trap (Left side)
    Channel 7 - Lower Trap (Left side)
    Channel 8 - Serratus Anterior (Left side)
```

Additionally, there should be a picture taken during each trial that clearly shows the electrode placement on the subject. Please ensure that the participant's face is not visible in the picture for privacy.

3 Preparing the yoga.txt File

A `yoga.txt` file should be included in each sub-directory and should contain a list of yoga poses or MVC exercises corresponding to the EMG recording files you have. Each pose should be written on a new line in the order of the time of recording. For example:

```
downward_dog_MVC
mountain_pose_MVC
tree_pose_MVC
downward_dog
mountain_pose
tree_pose
downward_dog
mountain_pose
...
```

The number of lines (poses or MVC exercises) in this file should match the number of EMG recording files in the source directory.

4 Data Acquisition

The data collection should be carried out using the OT Bioelettronica software. For each participant, start a new recording at the beginning of each yoga pose. Use the OT Bioelettronica software timer to ensure that each pose lasts the same amount of time. Save the recording in the appropriate subdirectory.

5 Renaming Directory

You should create a separate directory where the renamed files will be saved. It's recommended to replicate the same structure as the data collection directory to keep things organized.

So, you will have another directory (for example, "`EMG_Yoga_project_renamed`") with sub-directories for each participant. Here's how it would look:

```
EMG_Yoga_project_renamed
├ YP1_testing_1
├ YP1_testing_2
└ YT1_testing_1
```

Now you can use the `rename_EMG_files.py` script to copy the files in the new subdirectories you have created.

When you run the renaming script, you'll be asked to select the .txt file containing the list of yoga poses, the source folder (from the "`EMG_Yoga_project`" directory) containing the `.otb+` files to be renamed, and the destination folder (in the "`EMG_Yoga_project_renamed`" directory) where the renamed files will be saved.
You'll need to run the script for each participant trial separately, selecting the corresponding source and destination folders each time.

6 How to Use the Renaming Script

1. **Start the script:** Open a terminal (or command prompt in Windows), navigate to the directory containing the script, and run the command `python3 rename_EMG_files.py`.
2. **Select the .txt file:** A dialog box will appear asking you to select the .txt file containing the list of yoga poses. Navigate to the location of your `yoga.txt` file, select it, and click "Open".
3. **Select the source folder:** Next, a dialog will appear asking you to select the source folder with .otb+ files. Navigate to this folder, select it, and click "OK".
4. **Select the destination folder:** A dialog will appear asking you to select the destination folder to save the renamed files. Navigate to the folder where you want to save the renamed files, select it, and click "OK".

The script will now run. It will read the yoga poses from the .txt file, list the EMG recording files in the source folder, sort them based on date and time, rename them according to the specified format, and copy them to the destination folder. If there are any issues (such as a mismatch between the number of poses and files), the script will print an error message and stop.

Please note that the script assumes the source folder's name is in the format "participantType_otherInfo", and it will take the part before the first underscore as the participant type. If your source folder's name doesn't follow this format, the script will not work correctly.