**Chapter\_3\_Scripts\Step4\_statistical\_analysis folder README**

This document describes the contents of the folder named Step4\_statistical\_analysis. The scripts in this folder retrieve results data from folders for the previous steps, perform statistical analysis, and save the results. They also print various descriptive statistics to console, or save them to file.

**Dependencies**

* Microsoft Excel
* R version 4.1.3, with the libraries:
  + dplyr
  + tidyr

**Contents**

* **Frequency\_stats**
  + **WCoh\_2022-03-18\_Amor\_BandsEEG\_FAST\_Unrect\_UID-3641** … etc (one for each folders in Step3\_frequency\_analysis\Results). Test results are saved in .csv files:
    - Anova\_Two-way\_Df.csv.
    - Anova\_Two-way\_F.csv.
    - Anova\_Two-way\_P.csv.
    - Anova\_Two-way\_TukeyPvals.csv.
  + **Supplemental\_Mwave**. As above but for Mwave data.
    - **WCoh\_2022-03-18\_Amor\_BandsEEG\_FAST\_Unrect\_UID-3641** … etc (one for each folders in Step3\_frequency\_analysis\Results). Test results are saved in .csv files:
      * Anova\_Two-way\_Df.csv.
      * Anova\_Two-way\_F.csv.
      * Anova\_Two-way\_P.csv.
      * Anova\_Two-way\_TukeyPvals.csv.
* **TimeToPeak\_stats**
  + Anova\_Two-way.csv. Results of the ANOVA test.
  + Anova\_Two-way\_TukeyPvals.csv. Tukey P values for comparisons between each condition (corrected with Bonferroni).
  + Anova\_Two-way\_TukeyPvals\_Bic\_Tric.csv. Tukey P values just showing comparisons between biceps and triceps (corrected with Bonferroni).
  + N\_trials\_per\_sub.csv. Number of trials per subject for each muscle and condition.
  + Timetopeak\_means\_dif.csv: Table showing the means, standard error of the means, and standard deviations of the difference in time to peak between biceps and triceps. Calculated from subject means.
* \_README.docx. This document.
* Frequency\_stats\_ANOVA.r. R script to perform ANOVAs for each of the folders in Step3\_frequency\_analysis\Results. Results are saved in a folder of the same name in \Step4\_statistical\_analysis\Frequency\_stats .
* Frequency\_stats\_ANOVA\_details.xlsx. Excel sheet which outlines how the conditions and n numbers run for each test.
* Supplemental\_Mwave\_Frequency\_stats\_ANOVA.r. R script to perform ANOVAs Mwave comparisons for each of the folders in Step3\_frequency\_analysis\Results. Results are saved in a folder of the same name in \Step4\_statistical\_analysis\Frequency\_stats
* TimeToPeak\_stats\_ANOVA.R. R script to perform ANOVAs for time-to-peak comparisons. Time-to-peak data is taken from Step2\_SortForMatlab\Alldata.csv. Results of tests are saved in: TimeToPeak\_stats.
* TimeToPeak\_stats\_ANOVA\_details.xlsx. Excel sheet which outlines the test details and conditions included.

***Running statistical tests***

If the repository has been downloaded and the folder organisation maintained, these files should run as they are with no input. You can change the parameters as you wish to try different tests.