

CIRCULAR TASK :

Report of the difficulties and results verification

1. Introduction

This report details the analysis of human performance data collected during a circular targeting task. We used the data provided in the assignment but also data that we collected ourselves on MouseReMoCo.

The team was composed of Alexis Lagarde and Antoine Lescarbours. Alexis' part was principally the signals over time (on both datasets) while Antoine's was more the position plots (on both datasets too). Only one member was supposed to merge on GitHub, so Alexis took this role.

In this report, we will present the principal difficulties that we encountered during this project, the solutions that we found to counter them, and the verification and validation methods that we used to ensure the accuracy of our results.

2. Difficulties encountered and resolved

The project's most complex difficulties revolved around data integrity: correctly segmenting individual trials, locating necessary geometric parameters, and ensuring the stability of the processing environment.

2.1. Segmenting in different records

To do an accurate analysis we were required to segment the continuous stream of mouse position data (001MoDe_R1.csv) into discrete trials.

Our first difficulty was that we used the "0,0,0,0" lines in the "001MoDe_R1.csv" file to separate each record. It worked for the teacher's dataset, but not for ours.

The segmentation was in fact resolved by using the companion file, "001MoDe_R1.marker.csv". This file contained explicit, time-stamped markers (like "DoRecord" and "DoPause"). By synchronizing timestamps between the two files and attributing all the lines having a timestamp between the start and the end of each record, we created precise masks to accurately isolate the raw data for every record.

2.2. Defining targets

The round graphs reproducing the mouse trajectory were also reproducing the target of MouseReMoCo.

We started by trying to reproduce manually those targets. It was nearly impossible to be accurate.

We then realized that the necessary values were disponible in “001MoDe_R1.marker.csv” so we used this the InternalRadius, ExternalRadius and CursorRadius to compute these targets.

2.3. Recomputing statistics

This third and final difficulty hasn’t really been solved.

We didn’t quite understand where we were supposed to find necessary values to recompute, so we used the same ones as the ones for the assignment.

2.4. Last minute problem

We sadly had a last-minute problem with the code and our own data. Indeed, the code worked with both datasets when we last tested it, but we must have lost a part or done an error in the commits because now we can’t have exactly what we had before.

The lack of time prevents us from correcting this mistake.

3. Results verification and validation

To ensure that the analytical results were really accurate, we did a double-verification.

First, we used a visual verification. Indeed, when reproducing the assignment’s plots, we tried started by looking of they were resembling to what we had plotted. Also, when plotting graphs of our own dataset, we looked if the plots were “logical” and plausible compared to what we had done on MouseReMoCo.

We then did a numerical verification. We compared the number of samples, the start and end times, the duration and the frequencies per record, and the tables with what was in the assignment. For our data, we just look if the numerical values were in the same range as the assignment’s because it should be similar.

These dual verification methods provided essential confidence in the integrity of the final performance metrics derived from the experiment.