KINEMATICS LAB EXERCISES (DAY 1: MEASURING)

Lab-demo 1

Getting started

- In QTM, make a new recording (the white paper symbol or File -> New)
- You should see all 8 tracking cameras and the image of the synched video camera
- Move the marker a little to see where the little white dot is shown

Setting AIM

- Go to settings (the wheel symbol or Tools -> Project Options) and find the AIM tab
- For task 1, we need the 'single_pen' in Applied Models. Check whether that's the case, otherwise load it from the list.

Recording

- Start recording (red button)
- Do Task 1 *(which will be revealed to each group in the lab ☺)*

Looking at the data

- Replay the video (play arrow in the top menu bar)
- With the mouse, turn the 3D view so you can see the trajectories in a reasonable position
- Click on the marker (in Trajectory window) to show its movement in the Trajectory Editor

Trimming the recording

- Stop recording
- Fine-tune the replay so only the relevant movement is shown (tip: use the Trajectory Editor to see where the actual movement is)
- Check your trimmed recording by replaying it again, then stop
- As a fun (but sometimes really useful!) gadget, drag the upper triangle in the replay window (below the main window) to the right and then drag the lower triangle towards the left ☺

Saving and exporting

- Now save your first measurement with the name 'groupX_task1', where X is your group number (ask Cordula). Your new measurement should appear in the Project data tree
- Last step: Export your data into a more common format (File -> export -> TSV) under the same name
- In the bottom, you can see it only exports your selected range now
- On top, you could choose what to export. We stick to the default (3D and analog)

Lab-demo 2: Reach-and-grasp task à la Ansuini et al.

Preparations

- We need 3 roles:
    1. Participant (P) gets their right hand recorded doing the task
    2. Experimenter (E) performs the task with P
    3. Controller (C) is in charge of the recording and the trial progression
- Reuse some of the knowledge from task 1. The rest is as follows:

Ansuini's conditions

(1) GRASP: Grasp it without performing any subsequent action.
(2) THROW: Lift and throw it.
(3) POUR: Pour the water into a container.
(4) PLACE: Place it accurately on a target area.
(5) PASS: Pass it to another person.

Participant P

- Esp. you should not to have rings or other shiny things on your hands and wrists
- In each trial, wait for C's instruction about the upcoming action and an auditory go signal
- Move naturally, don't overthink
- Sadly, we'll only pretend the pouring. Still, make it as realistic as possible.

Experimenter E

- Attach markers on P's index finger, thumb and wrist with skin-friendly double-sided tape
- Calmly move things back, no rush
- Listen to C to be prepared for your own action
- Smile ☺
- Hold the cardboard box on the side in the Throw condition so it doesn't fall down
- In the 'pass' condition, hold your hand above the center red dot

Controller C

- Open Matlab (file needs to be 'task_code.m')
- In QTM, load the AIM file 'ansuini_right_hand'
- ALWAYS start QTM recording FIRST
- Only then start Matlab file with the green arrow ('Run'): Almost all the rest of the procedure is taken care of by the program; your role is to set the pace
- Keep track of the conditions: name them loudly to P and E
- Check first whether everyone's ready (e.g. E has prepared everything), then press ENTER to generate a tone and start the recording

Group discussion: Being an experimenter

- Make a list of attributes that a good experimenter should have. Which ones are essential, which only nice-to-have?
- I assume you have had an intro to ethics (also with an online course, right?). Remind yourself which aspects matter most and why.
- Discuss what ethical concerns behavioral studies like those we mostly target in this course have, also in comparison to (1) neuroimaging, (2) patient studies, (3) studies with children, and (4) observation studies.
- When done, make a draft for a consent form that includes relevant aspects pertaining to all / most studies. For inspiration, you can use the 'Cognition and Behavior Lab' website and also read up on what AU has to say about research integrity (on their website).

Group discussion: Movement tracking and analysis

- What are differences and similarities between mouse-tracking (in the form we have used it) and motion-tracking?
- Many studies on intention / intention recognition use grasping as an example. Try to think of other actions that – might – be differently performed depending on the non-basic goal.
- Thinking ahead to tomorrow: Why do most movement data need to be filtered? What are potential problems with setting the same filter to all participants? Why would we still like to do that?

Group discussion: Extra inspiration about using the Motion Lab

- Discuss possible experiments that need motion tracking or, at least, could benefit from it.
- Think of some of the effects we discussed (e.g. from the Rosenbaum paper of Lecture 1) and think about how to turn that into an interesting experiment in the Motion Lab.
- Challenge level: When you're done, you're welcome to think about additional things you'd like to know or try in the Motion Lab during Day 2 tomorrow. This could be learning more about calibration, practicalities, Matlab integration, or even trying out another small effect of your liking. Further inspiration might come from checking out their website https://www.qualisys.com/ (no, I do not get anything for promoting them ☺).

Starting on your exam project: Finding common interest groups

- Use the time today to find an interesting topic and start working out the idea. You can choose to replicate an existing mouse-tracking task, adapt an existing pure-RT decision making task, or completely design your own new experiment. Today is for creativity!
- Spend time discussing with others what ideas you have. That helps inspire everyone and might lead you to form a group of 2 or 3 students working together on the exam project.