Score behaviours out of experiment video

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<u>Goal</u>: create an Excel file that contains timeline for behaviours from an experimental video using Matlab R2019a.

When having a video, you may need to score a certain behaviour such as freezing, grooming, or even position in a plus maze. The following script permits you to score those behaviours simultaneously, while watching the video by simply pressing keys when the behaviours occur. You can then find start times and end times for every behaviour in different sheets of the same Excel file.

We will illustrate the explanations with the example of a plus maze experiment where we want to score position of the rat.

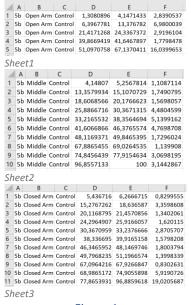


Figure 1
'Fake' data for 100 seconds

- 1. Create an Excel file with at least **enough sheets** for the number of behaviours to score. For example, if you want to record position in a plus maze, you will need at least 3 sheets (open arm, closed arm, middle) and the data will be written in the 3 first.
- 2. Fill 'workingfilename' with your file name. If your file is in the same repertory than this script, you just have to write the name of the file between apostrophes ('). If the file is in a different repertory, you need to indicate the path, for example from the root ('E:\folder1\...\fileName.xlsx').
- 3. Fill 'NKeys' with the number of behaviours you want to score at the same time. That will correspond to the number of keys you can press during the running. In the example, NKeys=3.
- 4. Fill the names of the behaviours you want to attribute to every key in array 'behaviours'. The order in the array should be the same than the order of the sheets in the Excel file and it will be the order of the attributed 'FX' keys. For the example of the maze, if you want Sheet1 to be scoring when the rat is in the open arm, Sheet2 for closed arm and Sheet3 for middle, your 'behaviours' array will be

behaviours={'Open arm','Closed arm','Middle'} and F1 corresponds to open arm, F2 closed arm and F3 middle. Note that if you have a doubt, when you run the program, the correspondence key/behaviour/sheet is reminded before trial starts and at the end of the scoring, in the Excel file, the behaviour that was recorded will be presented (see Figure 1).

- 5. Precise if you would like to add a column to put additional information on the trial. This information could be relative to the rat (control,lesion...), to the conditions of the experiment (low, normal volum CS...), the phases in the experiment (preCS, CS1...) by putting the Boolean 'descriptor' to true or false. This additional column will be common to all the behaviours as you can see in Figure 1. In the case of a plus maze you could precise that the rat is a control animal for example. Note that if you want to use the script 'plotUSVFreezing.m' afterward, you need to have this column to distinguish the phases.
- 6. Fill **'totTime'** with the time length of the scoring. Here, we did a 'fake' scoring of 100 seconds for a maze experiment so totTime=100.
- 7. You can decide if you would like to add a count down before the trial recording start by filling 'countDown' with the number of seconds you would like to have. It can be useful if the video starts directly with the part you are interested in. For our example, the rat is directly moving in the maze so it could be usefull to put a count down of 3 seconds and launch the video right at the beginning of the trial. If you don't want any count down, the trial starts directly after you push enter when the script ask you that, for that say countdown=0.

8. While you run the script, before the actual start of recording, you have to indicate the name of the rat being studied in apostrophies (in example, '5b') and, if you said that you want the additional column to appear, the text that you want to write in it, also in apostrophies (in example, 'Control').

Then, the different keys that you can use will be reminded to you. You can study maximum 12 behaviours (from F1 to F12). **The keys are the 'FX'** with X being the number of the sheet corresponding to the key. For example, if you say that open arm is in sheet 1 of the Excel file, then when the rat is in the open arm in the video, you have to press 'F1'.

The command window on Matlab will look like the following, with no count down on the left and a 3sec count down on the right.

```
>> scoreAny
Which rat is being observed? (Write name in apostrophies): Rat '5b'
Which phase is this? or any descripter (Write name in apostrophies): 'Control'
Recording for 100 seconds
Press F1 for Open Arm. recorded in sheet 1
Press F2 for Closed Arm, recorded in sheet 2
Press F3 for Middle, recorded in sheet 3
Press F4 for Closed Arm, recorded in sheet 3
Press F5 for Closed Arm, recorded in sheet 3
Press F6 for Middle, recorded in sheet 3
Press F7 for Middle, recorded in sheet 3
Press F8 for Middle, recorded in sheet 1
Press F8 for Middle, recorded in sheet 3
Press F8 for Middle, recorded in sheet 1
Pr
```

The final output Excel file will look like the following table (with column C in option).

A B C D E F

#Rat Behaviour Descriptor Time Start Time End Duration
...

Remarks:

- Make sure that you close your output Excel file before running the script. If you don't, the
 script still run until the end but can't save the data in the Excel file and you have to re-do the
 scoring.
- It is possible to press 2 keys at the same time, which could be useful when scoring certain mutually non-exclusive behaviours. Take that into account while recording mutually exclusive behaviours, such as being in the open arm OR closed arm of the plus maze.
- It is possible to add some data even after having modified the rest of the sheet. For that, there are certain restrictions:
 - You have to keep the same number of columns when recording (you can't remove the 'descriptor' column for example.
 - You can't write in the 6 or 7 first columns as they may be filled with more data except if you fill the all line you are writing in. This way, you can add titles, remarks, separations...



