**Memory Segmentation Task Running Instruction**

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Task requirements:

1. One laptop for the task display. Psychtoolbox (http://psychtoolbox.org/download#Windows) and Gstreamer (https://gstreamer.freedesktop.org/data/pkg/windows/) need to be installed.
2. Cedrus RB-740 response pad or an external keyboard for collecting subjects’ response
   1. If Cedrus reponse box is used, the first 6 keys from the left are enabled
   2. If an external keyboard is used, key ‘s,d,f,j,k,l’ are enabled
3. EyeLink 1000 to track subjects’ eye movements (optional)
4. cPod device sending TTL pulses as synchronization signals between the Psychophysics and Neuralynx computers.

Task setup:

1. Connect the EyeLink 1000 with the computer with EyeLink driver installed via the Ethernet cable (optional)
2. Connect the EyeLink 1000 with the Psychophysics computer via the Ethernet cable and change the configuration of IP4 manually: ip-address: 100.1.1.2 and subnet mask: 255.255.255.0 (optional)
3. Connect Cedrus response box or external keyboard to the Psychophysics computer via USB port.
4. Connect the Psychophysics computer with Neuralynx system via parallel port.

Task Description:

This experiment has three sessions:

1. Encoding session (~12mins): subjects will watch a series of video clips (no sound). After each clip presentation, the subject will be asked whether the majority of the clip happens INDOOR or OUTDOOR via pressing the Cedrus response box or an external keyboard.
2. Scene recognition session (~12mins): after the encoding session, subjects will be presented with a series of images, mixed with targets (images from the movie clips they watched) and foils (images they haven’t seen before). Subjects need to determine whether the image is OLD or NEW via the Cedrus response box or an external keyboard.
3. Time discrimination session (~20mins): after the scene recognition session, subjects will be presented with pairs of images (all from the movie clips they watched). Subjects need to determine which image (LEFT or RIGHT) appears first in the original movie via Cedrus response box or an external keyboard.

Running experiments:

**\*\*\* Highly suggest running this task using none java mode if using the MS-Windows computer, see more info in the troubleshooting \*\*\*\*\***

1. Launch MATLAB. Set the working path as ‘\*/MemOrder/Task\_GUI’
2. Set path: type command line “setpath\_MemOrder” (setpath\_MemOrder.m needs to be updated with paths where task is stored)
3. Encoding session: type the command line “A00\_MemOrder\_Encoding”
4. Scene recognition session: type the command line “B00\_MemOrder\_SceneRecog”
5. Time discrimination session: type the command line “C00\_MemOrder\_TimeDiscrim”
6. For all three session,
   1. At the beginning of each session, when the blank grey screen appears, you can press ‘SPACE’ to proceed
   2. Then please read the instructions to the subjects and address subjects’ questions if any
   3. Press ‘SPACE’ bar to proceed the example part, please remind subjects that:
      1. Make their decision only when the prompt appears.
      2. The meaning of each key. They might need to get used to the confidence rating
      3. For the encoding session, the response period is self-paced. For the scene recognition and time discrimination, the response time window is 2 seconds.
7. When the subject is ready, press ‘SPACE’ bar to start the real experiment.
8. During the experiment, at anytime, you can press ‘’Esc’ to quit the task if something happens (e.g. subject starts a seizure)
9. During the experiment (B00 and C00), you can press ‘Tab’ during the image display to pause the task then a blank screen will appear. Also, you can press ‘Tab’ again whenever you want to continue the task
10. Subjects’ behavioral output file is named with subject\_id and saved as a mat file under folder ‘\*/MemOrder/Task\_GUI/D00\_Logs/’. The file of TTL outputs and eye tracker outputs is named with subject\_id and saved as a txt file under folder ‘\*/MemOrder/Task\_GUI/D00\_Logs/eyeLogs/’.

Customized settings:

% Setup for Cedrus reponse box

para.cedrus\_flag = 0; % Will use cedrus box for response? 1 = YES, 0 = NO

% Setup for EyeLink1000

para.eyelink\_flag = 0; % Will use EyeLink1000 for eye tracking? 1 = YES, 0 = NO

% Need to send TTL pulses?

para.TTL\_flag = 0;

Troubleshooting

1. Problems of loading movies: When running A00\_MemOrder\_Encoding.m in MS-Windows, you might encounter Sync Trouble and the MATLAB might crash when loading videos. If that’s the case, please try the following steps:
   1. Download the latest Gstreamer. During the installation, please choose the customized mode and check all the components to be installed.
   2. A screenshot of a social media post

      Description generated with very high confidenceEnable the ‘Vertical Sync’ in your Graphic card setting. For Windows 10, you can press the button ‘CTRL + ALT + F12’ to access the graphic card setting and change the configurations similar as shown in the picture below:
   3. Open ‘Command prompt’ and run MATLAB with none java mode by typing the command line ‘matlab.exe -nojvm’
2. Problem of sending TTL pulses

If you get the following errors from the MATLAB, it’s highly likely the input/output setting is not correct. Then double check the I/O configurations by doing the following:

Struct contents reference from a non-struct array object.

Error in outp (line 22)

io64(cogent.io.ioObj,address,byte);

Error in sendTTL (line 17)

outp(20472, TTLValue)

Error in sendTTLsEYElink (line 4)

sendTTL(TTLcode);

1. Download the [**io64.mexw64**](http://apps.usd.edu/coglab/psyc770/misc/x64/io64.mexw64) module and move it to a directory in your MATLAB path.
2. Download the [**inpoutx64.dll**](http://apps.usd.edu/coglab/psyc770/misc/x64/inpoutx64.dll) module and move it to the C:\windows\system32 directory.
3. Add command line ‘config\_io’ at the beginning of each task script.
4. Try ‘sendTTL(1)’ in the command window first, this should work now. If not, check more info at apps.usd.edu/coglab/psyc770/IO64.html
5. ‘ESCAPE’ key

In some of the windows computer, it will still give you the error ‘Error using KbName (line 870) Key name "ESCAPE" not recognized. Maybe you need to add KbName('UnifyKeyNames'); to top of your script?’ even when you put kbName(‘UnifyKeyNames’) ahead. So just change the command line to escapeKey = KbName(‘Esc’)