# initPsychtooblox

This function initialize psychtoolbox with several key parameters to make sure that it runs in an optimal way. There are a lot of global variables at the top, we might want to get rid of some (if not all and have everything as args).

The first important things that happens in there is the PsychDefaultSetup which setups up the psychtoolbox default parameters. See the psychtoolbox doc for more info-

Then the next one is setting whether or not to skip the sync test. In the current state of the script, we have the preference set to skip the sync test. This must be changed. We are doing it that way with ECOG because we are running on laptops and get crashes otherwise. The experiment was tested to ensure that this is not an issue in our case. But for an experiment in a lab, that should be set to 0.

Then, the script is grabbing a couple of parameters from the screen and setting which one to use.

Then, the Screen gets opened once. Further parameters are gathered. But then the screen is closed again. That might seem weird but this intended. You need to first open the screen to be able to get certain parameters. But then, we want to compare these values to expected values. That way, we can then reopen the screen a second time around, presenting an error as soon as the screen shows to display a message warning the user that something isn’t as it should be.

Then a couple more things happen that aren’t super crucial and specific to COGITATE.

Finally, we get back to open the screen. This time is for good.

There is one important thing that happens at line 92: getVisualAngel. This is an important function. It is scaling the stimuli size with respect to the distance between the participant and the screen. If you sit very close to the screen, stimuli will be very big compared to if you were to sit 2m away. This little function converts the relative size of the stimulus into a physical one to make sure that the stimulus is of the same size on the retina regardless of how far you sit.

Up until line 135, it’s setting up a couple additional parameters, check out the psychtoolbox if you are interested in what they do. After line 135 it is taking care of audio stuff. If your experiment doesn’t have any audio stuff, just get rid of that

One action item to do with this function is to compare it with the basic visual presentation tutorial of PTB. A lot of these parameters settings are redundant or useless. For the sake of getting good code for publication, we should clean it up.

# initConstantsParameters

The goal of this function is to set any parameters that are constant throughout the experiment. But it is insanely long and is a good example of how complicated things can become if you have several people working on a code that was meant to do something different in the beginning. This function is doing two things at the same time: trying to define parameters that are fixed as well as compute numbers for the trial matrices. I think we should keep the former and ditch the latter. It makes a lot of sense to have a function where you can specify the name of the files that will end up being saved, the text displayed in the instructions and so on in here. If you want to change the instruction, it make sense to have them in a place that is easy to find and adjust rather than having to go somewhere in the middle of the code.

For the trial matrices, I suggest we do the following: once we have a good idea of what the moving pieces of the experiment will be, we will have functions independent from the experimental code itself that will generate the trial matrices with all the relevant information ahead of time. This offers more flexibility and makes it easier to iterate over ideas without having to proceed to the experiment.

# initEyetracker

This function starts up the eyelink eyetracker and setups a lot of relevant parameters to make sure it behaves as we want. There is a lot that is very useful in there. But there is a lot that is specific to the COGITATE and should be removed. Again, if anyone were to look at the code after publication would find it very confusing that there is something like strcmp(LAB\_ID, 'SE') if that doesn’t apply. So here again, the process will be to extract out only the relevant bit and make the code clear and concise.

# getTexturesFromHD

This is another important function for an experiment. It takes a lot of time to load pictures from a hard drive. If any time you want to show a specific stimulus, you have to load the image first, you will have terrible timing. So what you do instead is that you load the stimulus into memory before the experiments begin. Then, you can access them very quickly into memory. But for that, you need a so called pointer to them. This is what the next function does:

# getTexture

This function is basically calling the one above. The one above loads a single image from the hard drive and gives it a number to access it from the memory. So this function takes care of the mapping: “I want to show this face: that’s this face pointer in the memory”

So all of the above is taking care of setting everything up. We now have PTB setup, the eyetracker, the stimuli, the instructions… One thing that is missing is the trial matrices. We need a trial sequence that displays the stimuli after another in a specific order. As discussed above, we need to come up with such a matrix tailored to the specific experiment. Once we have this, one additional thing we will need to take care of is load that matrix. So we leave that aside for now.

Now assuming we have all the info we need and everything is setup correctly, we can loop