How to create an endless Virtual Tunnel with flashing images

In this example scenario, different sets of cues (6 cues each) are placed on the two tunnel walls in a virtual tunnel. One side is the target side, the other side is the distractor side. The target set of cues stays the same, whereas the distractor cues set is changing with the help of a pre-defined sequence file. A Wheel is used as the input device.

Create a New Maze

For this experiment, load the TunnelDiscr.maze file by clicking *load maze* in MazeMaster.

If you want to create your own maze, start the MazeBuilder by clicking on the button in the top panel.

The easiest way of creating a new tunnel, is to use the *Create Maze by Values* panel. There you can enter a length and width for the tunnel, to create it automatically. One square in the MazeBuilder grid equals the size of one visual cue and has a length of 20. Since the tunnel should show six cues in total on each wall, the length would be 120.

If drawing the tunnel by hand, always start with the left (on the grid) long wall, setting it's starting point the top and it's endpoint further down. The start position should be positioned at the top of the maze in the grid, since it is facing towards the bottom by default.

Textures

Textures for *ceiling* and *floor* can be loaded by clicking one of the buttons. The textures should be square in size.

Place a reward point somewhere in the maze, where you want to have the reward area. Normally, the area is placed at the end of the tunnel.

The maze is now ready and can be named and saved.

Configure Input Device

Go to *windows*→*Input* devices and select *wheel*.

Set General Settings

Either create a new configuration file for your settings, or load an existing one. For this example experiment, load the task setting *endless* from the experiment *virtual tunnel.*

Set Maze settings

Open the window *windows*→*Maze Settings* in the top menu. Make sure, that *New Trial after Teleport* is unchecked and *New Trial after Reward* is checked. Close the window by clicking *Save*.

Load Cues

The cues are shown in the cues section on the left side. Ten cues can be loaded in total to show on the maze walls. A new cue can be loaded by clicking on the image/placeholder of the cue. An already loaded cue is replaced with the new one. You can delete cues by right-clicking on the cue image.

All loaded cues can be saved as a set of cues, which can be loaded afterwards. For this, use the *Load Cue Set* and *Save Cue Set* buttons.

For this example experiment, you can load the set, which is placed in the example folder (*bars*).

Cues can be shown in two different modes: Flashed or as texture on the wall. When the flashed mode is used, the images will be flashed on the walls at the sensor positions for a certain duration, which can be set here as well. Uncheck *Flash Cues* and check *Cues on Walls.*

Sequences

A predefined set of Stimuli can be used in a given order. For this, a file with the order of the stimuli numbers has to be loaded (as a .csv file) before the session starts. This is done by clicking the load Sequence button. With this it is also possible to do an omission of certain images. Load the *Sequence.csv* file from the example folder. The opened list contains the IDs of the cues in the order in which they are shown in the whole session. Each trial, the number of cues is taken from this list to fill the tunnel. In this example experiment, the file holds the IDs and order of distractor images for the distractor side of the walls.

Flash Tunnel

To run this experiment as a 2-AFC task, the *flash tunnel* module is used. Click on *window→Tunnel Flashes* to open the settings window for this task. Set a cues sequence for the target in the *Target cue sequence* entry. Those are the IDs of cues, which are combined to form the sequence of cues on the target side of the wall. In this example, it should contain six white bars, so the sequence should be '111111', since cue 1 is the white bar cue.

Behavior Settings

Open the Behavior window (*windows→Behavior*), to monitor the behavior of the test subject. The rewarded side is shown, as well as the side on which the answer was given in the trial. Additionally, an answer history is shown. For this experiment, the lick detection should be activated, as well as the 2AFC Task settings. The answer and reward time can be set to two seconds each.

Trial Control Settings

The settings should be adjusted automatically by loading the pre-settings.

Disable the tracking mode, since the position of the wheel is saved separately.

The experiment should start, when the mouse is reaching a certain speed on the wheel. Set the start trial to *@ trigger*.

Start the Server

The graphical engine is ready to start. Click on the connect button in the server control panel to automatically start the engine. The server status should change to online, after a few seconds. When this is the case, the experiment can be started by clicking the start block of trials button in the trial control panel.