Orientation Discrimination: Lesson 5

In this lesson, you will learn how to:

- create time-varying stimuli,
- produce interleaved stimuli at the display frame rate.

This lesson assumes you have been through **Lesson 1** of this tutorial and became familiar with adding and inspecting the various types of events.

Difficulty: 1/5
Duration: 15 mn

1ST-ORDER DRIFTING GABOR

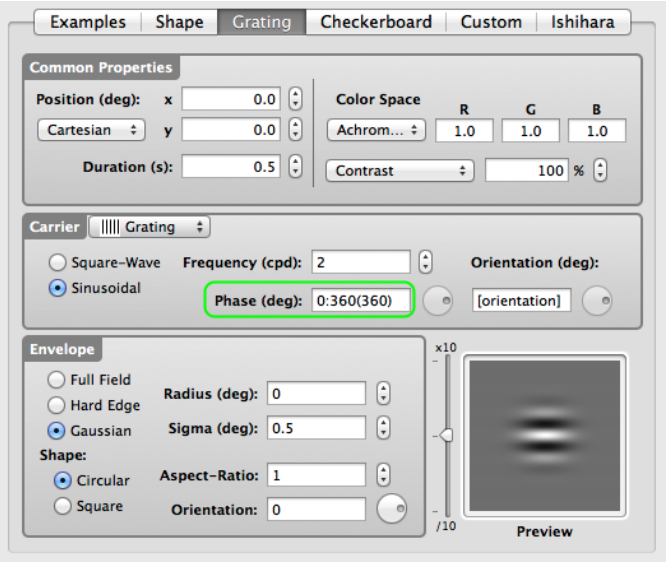
This lesson makes the basic orientation discrimination task more elaborate by displaying a 1st-order drifting Gabor stimulus on a 2D noise background.

First, duplicate the original experiment, rename the copy ***Orientation Discrimination 5***, and move it to the top of the **Designer** table. Reveal its whole hierarchy by option-clicking on its arrow.

Step 1: Creating a Drifting Stimulus

Rename the ***Gabor*** stimulus ***Drifting Gabor*** and edit its properties.

The drifting motion is created by specifying a time-varying spatial phase: enter ***0:360(360)*** in the phase text field of the carrier, as illustrated. This tells the phase to go from 0 to 360 deg (range defined by minimum and maximum values separated by a colon) at a speed of 360 deg per second (speed defined between parentheses). This corresponds to a drifting speed of 1 cycle per second.



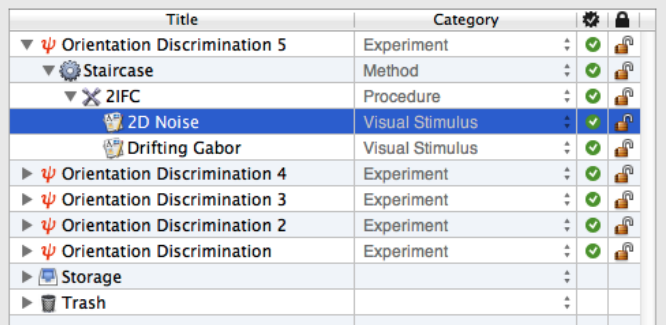
Click on the **OK** button to validate the changes and return to the **Designer** panel.

Check & run the experiment now to test it without the presence of a noise background.

***Tips**: There are alternative ways to create a drifting Gabor using the Phase parameter:*
*- Using an expression based on the **[TIME]** variable, for example **360*[TIME]** instead of **0:360(360)** to produce the same smooth motion*
*- Using **0:4:270(0.125)** to create apparent motion so the spatial phase jumps in a discrete manner through 4 steps (0, 90, 180, 270), each presented for 0.125 seconds*

Step 2: Adding a 2D Noise Stimulus

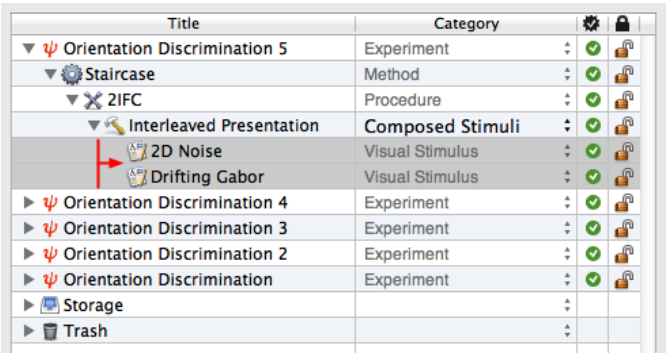
Similarly to what you did in [Orientation Discrimination Lesson 3,](#) create a 2D noise stimulus with a radius of ***2*** deg. Name it ***2D Noise*** and move it above the ***Drifting Gabor*** stimulus.



Step 3: Adding a Dynamic Composing Event

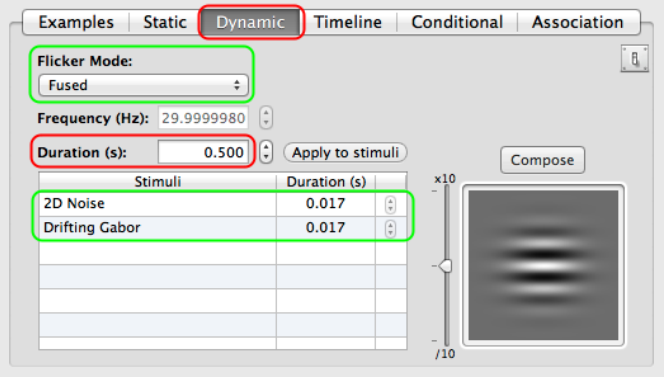
Select the ***2IFC*** procedure and insert a new **group** event using the '**+**' folder icon. Change the sub-category and title of this new group event to **Composed Stimuli/Dynamic** and ***Interleaved Presentation*** , respectively.

Select the two stimuli (***2D Noise*** and ***Drifting Gabor***) and drag & drop them onto ***Interleaved Presentation,*** so they appear indented to the right, as illustrated.



Edit the properties of the ***Interleaved Presentation*** event (select the **Dynamic** tab if necessary).

Select the ***Fused*** option in the **Flicker Mode** pop-up menu and set the overall **Duration** to ***0.5*** s.



The table presents the visual stimuli to be interleaved. Due to the selected **Fused** mode, their individual duration should correspond to the duration of a single display frame based on the display settings applied to the currently edited **Experiment** event (0.017 seconds in this example corresponding to a frame rate of 60 Hz). Note that the **Frequency** text field reflects the equivalent flickering frequency (30 Hz).

Click on the **OK** button to validate the changes and return to the **Designer** panel.

Check & run the Experiment!

Conclusion

In this lesson you learned how to create time-varying stimuli and interleave stimuli at the display frame rate.

Now that you have completed the whole tutorial on orientation discrimination you should be ready to design your own experiments!

If you are interested in further exploring temporal factors on orientation discrimination, you may try to extend this lesson by investigating the effect of various temporal parameters, such as motion speed, temporal frequency, duration, etc. In that case, make sure to go through **Lesson 2** of this tutorial as it shows how to configure different experimental conditions and run interleaved staircase methods.