

Orientation Discrimination: Lesson 5

You will learn how to create time-varying stimuli and produce interleaved stimuli at the display frame rate.

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 second

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 Gabor stimulus.

Step 3: Adding a Dynamic Composing Event

Select the **2AFC** procedure and insert a new group event using the '+' folder icon. Set the name and category of this new event to Interleaved Presentation and Composed Stimuli, respectively.

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

Edit the properties of the Interleaved Presentation event and select the **Dynamic** tab.

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.

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Experiment

Method

Procedure

Visual Stimulus

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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!