

Lab 6 – Stereoscopic & other Phenomena

ANAGLYPH STEREOGRAMS

Using the computer program, Insight™ — InColor, select the Stereograms option from the main menu. Select the Info option and review the introduction and instructions. You may need to use the scroll bar on the right side of the window to see the entire text.

Random dot stereograms

1. Return to the Stereogram main menu and select Begin.
2. From the menu bar at the top of the display, select Random Dots.
3. From that menu select Square. You will repeat this procedure to create different random dot stereograms with different configurations.
 - Keep dot density at 98 for all images
 - Choose one of the following disparity settings: 1, 5, 10, 15
 - Leave the object size at 100
4. For each random dot stereogram, observe the following
 - Wearing the red-green glasses, view the image monocularly with each eye. Do you see any figure?
 - View it binocularly (through the red-green glasses).
 - Reverse the red-green glasses. What happens to the perception?
 - Observe the other random dot patterns (steps, sine wave, etc.)

Outlines and Pictures

From the main menu, select the Outlines and Pictures. Select various images and observe them using the red-green glasses in both orientations.

Q. Do you notice that reversing the glasses does not reverse the depth as strongly as it did with the random dot stereograms? Explain why for both the outlines and the pictures?

KINETIC DEPTH EFFECT

Sometimes motion with the parts of a two-dimensional image can create a strong sense of three-dimensional shape. This is known as the **kinetic depth effect**. From the InSight main menu, select Form and Motion/Begin and ignore the warning.

1. Select the cylinder from the Object/Shape menu.
2. Go to the File menu, select "Generate movie", and wait for the computer to create the animation.
3. On the File menu, select "Play movie" and see if you can easily identify the shape.
4. Return to the Object menu and vary the Correlation and see what effect it has on how easily you can identify the shape. Using the Background menu, select different types of background to see which one most effectively camouflages the moving object.
5. Continue with the next shape.
6. Finally select biological motion and identify the object.

PULFRICH PHENOMENON

Using the pendulum and neutral density filters, see if you can experience the Pulfrich phenomenon. See which neutral density filter works best. Cover the opposite eye and see if the perception of depth reverses. You should be able to explain how this works.

LIFESAVER CARD

The life saver card is a simple stereogram that requires free fusion; that is the images of the two eyes are fused by diverging or converging the eyes. Polarizers or a stereoscope are not required.

1. Since the right and left images are different colors, it gives you the opportunity to observe **binocular color fusion**. Fuse the images and notice what color the fused image appears to be.
 2. Notice that some letters appear to be floating in air, above the plane of the card.
- Q. Study the design of the right and left stimuli and explain how they create the sensation of letters floating in the air.

SPACE DISTORTION WITH BI & BO PRISM

Hold BI and then BO prism in front of your eyes while you view the door frame for the passage near the stairwell. Record your perception in the table below.

| Subject name | Prism base | Amount | Feel taller | Feel shorter | No change |
|--------------|------------|--------|-------------|--------------|-----------|
| | BI | | | | |
| | BO | | | | |
| | BI | | | | |
| | BO | | | | |

VECTOGRAPH STEREOGRAMS

The Howard-Dolman apparatus presents stereoscopic stimuli using real pegs in space, but such a device is too bulky for clinical use. Instead we normally use vectograph cards that create an illusion of 3-D stereopsis using polarized images. We will study the Stereo Reindeer Test to learn how vectograph stereo tests are designed. This test is designed for a 14 inch viewing distance and assumed PD of 64 mm.

1. Wear the polarized glasses and observe the Reindeer long enough to appreciate the illusion of stereoscopic depth.
2. Next, observe the circles on the left side of the card.
3. Remove the polarized glasses and note that the circles seen in depth appear doubled. Which of the doubled circles is seen by the right eye? Which is seen by the left eye?
4. Notice what happens to the disparity if you flip the glasses (up/down).

Q. Explain how to make the circles have either crossed or uncrossed disparity.

Q. Measure how far the circle in Row A appears to be off the page and compute its disparity (in arc seconds).

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