Week 14 Presentation: Stereograms & Size Constancy

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Introduction:

This presentation examines Bela Julesz's pioneering work on cyclopean perception using random-dot stereograms and the classic psychophysics of size constancy.

Brainstorming Questions: 1. **Magic Eye Pictures:** Explain Random Dot Stereograms (Julesz). Explain, as if you were talking to, your aunt how a mess of static snow can turn into a 3D dinosaur. It's because our brain compares the tiny shift (disparity) between the left and right eye images to calculate depth mathematically, even without any outlines or recognizable shapes.

2. **The Tiny Car Trick:** Look at a car far away; it looks toy-sized on your retina. Explain, as if you were talking to, a 5-year-old why they know it's a real big car and not a toy. Tell them their brain does math (Size-Distance Scaling) automatically: "It looks small, but it's far away, so it must be HUGE!"

3. **Echolocation:** Some blind people can "see" with sound (like bats). Explain, as if you were talking to, your friend how reflected sound waves can create a "spatial map" in the brain, utilizing the same areas that usually process vision to navigate the environment.

Recommended Readings:

- Julesz, B. (1971). *Foundations of cyclopean perception*. University of Chicago Press.
- Holway, A. H., & Boring, E. G. (1941). Determinants of apparent visual size with distance variant. *The American Journal of Psychology*, 54(1), 21-37.