

Transparency and structure from motion

Bistability in Transparency and rigidity

When you initially view, you will most likely see one transparent (darker) square surface in front of a (lighter) opaque square surface, together rotating about a single axis.

This percept corresponds an interpretation of the front and back faces of a rotating cube viewed from slightly above, similar to: 1) two faces rotating about a single central axis.

but with a transparent rather than opaque front face.

However, if you look long enough at the first transparency video, eventually your perceptual interpretation will suddenly flip, and you will see the two surfaces apparently slipping and sliding over one another, where the lighter upper surface now appears transparent and in front, while the lower darker surface now appears opaque and in back. This percept looks like 2):

It is as if your "visual brain" "knows" about the physics of rotation and surface transparency, coming up with the split axes interpretation even before you are cognitively aware that this is a second possible physical explanation for the rotation.

Kersten, D., Bülthoff, H. H., Schwartz, B., & Kurtz, K. (1992). Interaction between transparency and structure from motion. *Neural Computation*, 4(4), 573-589.

These quicktime video demos were prepared by Gina Albanese.