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Cool Visual Illusions: Rotating Eyes on Inverted Faces

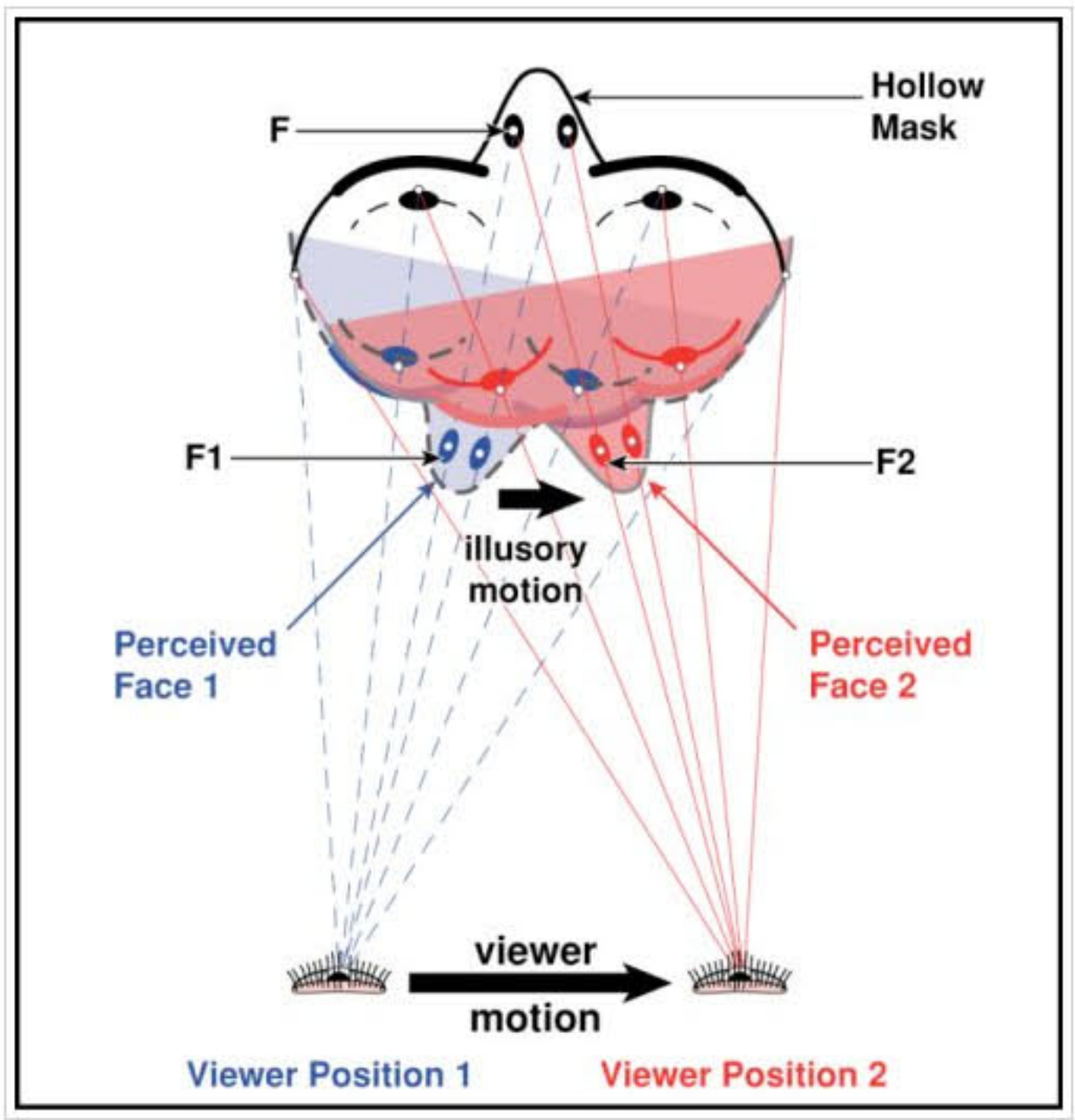
Category: Visual Illusions
Posted on: June 16, 2008 10:50 AM, by Chris

One of my favorite optical illusions is the rotating face, an instance of depth inversion. I like it so much that I sometimes use the above image as my avatar around the web.

If you're not familiar with the illusion, what you're seeing is a 3D mask, one side of which is convex, while the other is concave. When viewing the convex side, you see what looks like a normal face. As the mask slowly rotates, however, you begin to see the "inside" of the mask, on the concave side. Suddenly, however, the mask switches back to looking convex, like a normal face. This is likely the result of a confluence of unrelated factors. First of all, we're used to seeing convex faces (like yours and mine), so we have a really strong bias for seeing faces in that way. At the same time, all sorts of depth cues are mixed up when the face is concave, which in essence causes our poor visual system to be tricked and confused. As a result, it tries to reconstruct the image as best it can using its expectations -- e.g., that faces are concave -- and the end result is a powerful visual illusion. God love our not-so-bright visual systems.

Anyway, that illusions old, and visual illusion buffs know all about it. However, this year's third place winner in the 2008 "Best Illusion of the Year" contest is a novel twist on the hollow mask illusion. The illusion, discovered by Thomas Papathomas, can be viewed here. Check it out.

Back? OK, notice how the eyes roll and the nose ring moves, but *only when the face is inverted* (i.e., when you're looking at the concave side of the mask, and thus seeing the illusory face). Why does this happen? Papathomas provides this nice diagram to help explain the illusion(1):



What's happening in that diagram is that the illusory face is moving from left (position 1) to right (position) 2), while the mask itself is actually moving in the opposite direction. As a result, you see opposing changes of position for the face and the 3D objects on it (the eyes and nose ring). Your visual system fills in the gaps, and you see the illusory eye-rolling motion, and the illusory motion of the nose ring moving away from the face.

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[1]A more detailed explanation, along with the diagram from which this one was derived, can be found in Papathomas, T.V. (2007). Art pieces that 'move' in our minds - An explanation of illusory motion based on depth reversal. *Spatial Vision*, 21, 79-95.

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