

Depth Cue Integration is Cognitive Rather than Perceptual: Linton Un-Hollow Face Illusion and Linton Morphing Face Illusion

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We present two new versions of the Hollow Face Illusion that challenge our understanding of depth cue integration. Traditional accounts of depth cue integration operate at the level of visual experience. On this account, perspective or shading can cancel out (or even invert) perceived stereo depth. By contrast, Linton (2017), Ch.2, argues that depth cue integration is merely ‘cognitive’, leaving our visual experience of stereo depth intact. The strongest challenge to Linton’s account is the ‘Hollow Face Illusion’, where shape from shading appears to invert stereo depth. Here, we argue that perceived depth is not inverted in the ‘Hollow Face Illusion’. 1. Un-Hollow Face Illusion: The hollow of the ‘Hollow Face Illusion’ is space that physically exists (mask is concave), and yet is impossible so far as the illusion is concerned (illusion is convex). When we fill this concave hollow space with 3D objects (balls, rods, protruding nose) that are inconsistent with the illusion, we experience the illusory motion (which persists) as occurring on a concave surface behind the 3D objects. (Some experience this concavity without the additional objects). 2. Morphing Face Illusion: If we attach small balls to the tip of the nose, base of the nose, and cheek, and morph from a protruding face to a hollow face and back again, the ordinal depth between these three points is seen as switching veridically. Our explanation for the ‘Hollow Face Illusion’ is therefore ‘cognitive’: whilst we might be fooled by the ‘Hollow Face Illusion’, our visual system is not.

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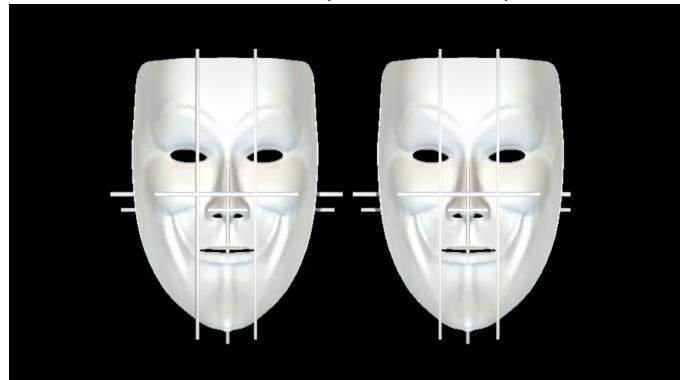
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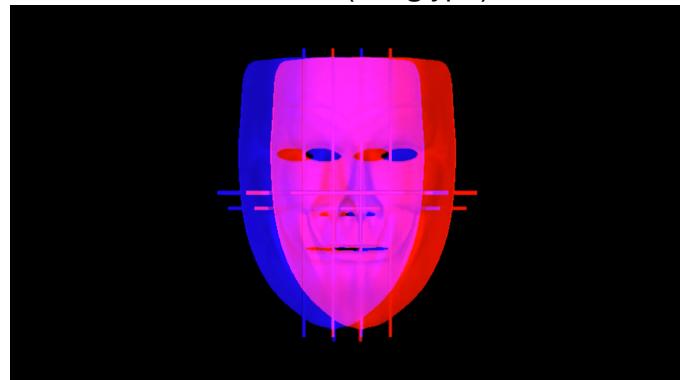
Linton Un-Hollow Face Illusion

Version 1 (cross-fusion)



[Video: https://youtu.be/zl4ai_GOAXA]

Version 1 (anaglyph)



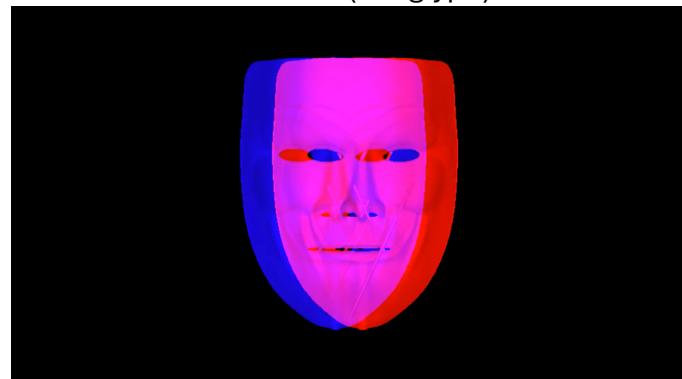
[Video: <https://youtu.be/33Ha-pxWNkA>]

Version 2 (cross-fusion)



[Video: <https://youtu.be/oaANXAX96a0>]

Version 2 (anaglyph)



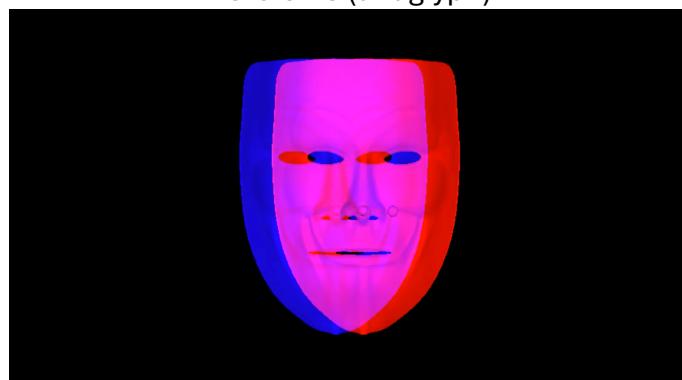
[Video: <https://youtu.be/o0Xzn4zwFTI>]

Version 3 (cross-fusion)



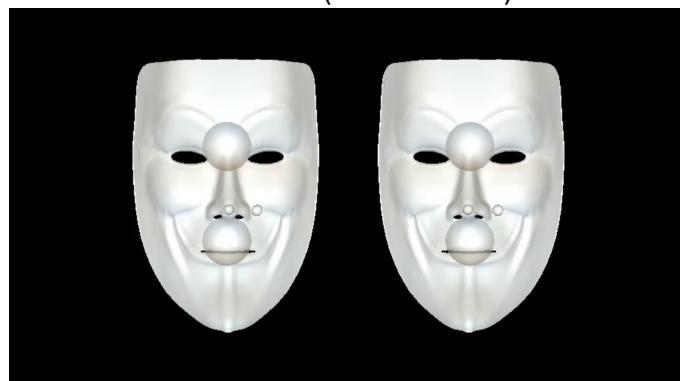
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Version 3 (anaglyph)



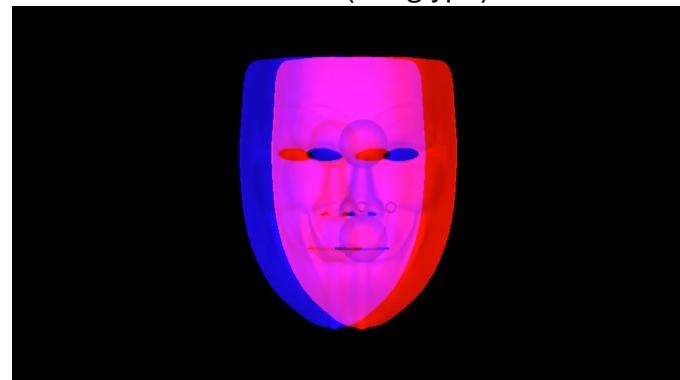
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Version 4 (cross-fusion)



[Video: <https://youtu.be/DfINqXABSCo>]

Version 4 (anaglyph)



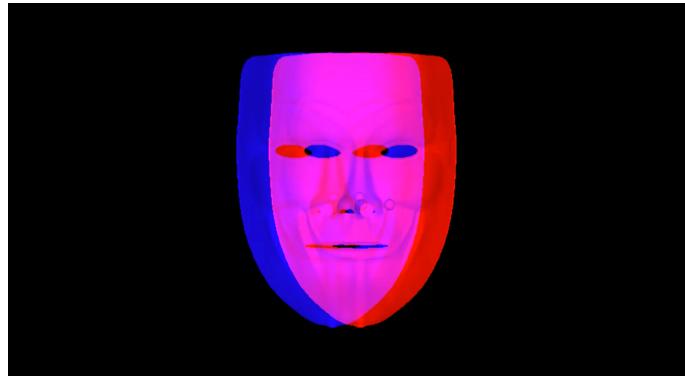
[Video: <https://youtu.be/Hc7Tg0U3T9c>]

Version 5 (cross-fusion)



[Video: <https://youtu.be/xEb1eO1pSeo>]

Version 5 (anaglyph)



[Video: <https://youtu.be/53h5uhAzNY>]

Linton Morphing Face Illusion



[Video: <https://youtu.be/R08jZN09SQE>]

Previous Un-Hollow Face Illusions from (Linton, 2017)

