24 Danswing papers

- An illusion to give motion impressions to papers -

Abstract

We propose a technique to give motion illusions to static paper objects. Previous studies have reported visual illusions wherein a static "virtual" object apparently moves on the basis of the luminance interaction between object's contours and the object's background. However, no studies have proposed a method to give motion illusion to a static "real" object. This study found a phenomenon in which a paper objects having bright and dark contours apparently moved against the background with dynamic luminance modulation. Manipulating the contour patterns could also produce not only a simple illusory movement such as translation but also relatively complex illusory movements such as expansion, contraction, and rotation. We call this technique Danswing (Dance + swing) papers. By utilizing the Dancing papers, it is possible to gather customer's attention towards an actually static, but perceptually dynamic, objects.

## How to create Danswing papers

●Apparently rotating heart object

①We digitally create images of a gray heart-shape figure, a slightly anticlockwise rotated white heart-shape object, and a slightly clockwise rotated black heart-shape object.

②The three heart-shape objects are digitally synthesized so that the gray object is set at the most front layer. The synthesized image is printed out, cut, and placed on the display with dynamic luminance modulation.

Anticlockwise **Clockwise**

Print & Cut → **Place it on the display**
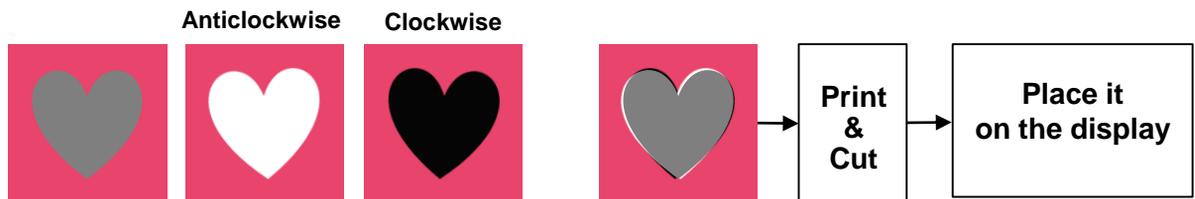
Visual mechanism for Danswing papers

●Specific bands of spatial frequency are related to Danswing papers.
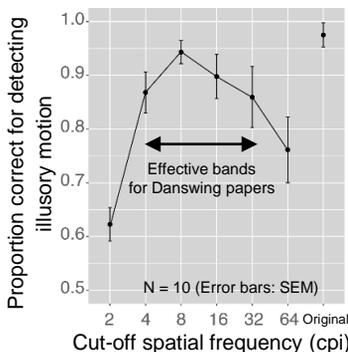
Using stimulus clips wherein a specific band of spatial frequency was extracted, we asked observers to detect illusory motion, and found that the observers' performance was good when the clips contained the specific bands of spatial frequency.

Please scan the right QR code, and check our YouTube clip of Danswing papers!

References

[1] T. Kawabe, "Danswing papers," in *Proc. SIGGRAPH Asia 2018 (SA '18)* Posters Article No. 4.

[2] T. Kawabe, "Danswing papers," Top 10 finalist of Best illusion of the year contest. http://illusionoftheyear.com/2018/10/danswing-papers/

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