

# Illusory Interactive Performance by Self Eye Movement

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## Abstract

Media performance unit cell/66b uses images, sounds and sensor devices to expand the performance potential of the body. Ongoing inquiry goes into the interaction between stage and audiences. Stage performances are generally designed to present images in one way, namely from stage to audience. Audiences basically see the same scenery of the performances on the stage, though there may be some differences between their positions. The concept of our performance, however, is to make the stage more interactive (i.e. the stage could be composed to include audiences) so that audiences could have a more individualized experience. Consequently, we realized an illusory interactive performance by using a saccade-based display. In our stage, audiences can perceive different images according to their eye movements, even if performers move in the same way. Thus, their own actions make the scene more interactive than what physically exists.

## 1 Performance with Saccade-based Display

The saccade-based display can present 2D images without any screen using only a single line of flickering LEDs. When a flickering light array moves at a fast enough speed, we can perceive 2D images through retinal afterimages as in fig. 1a. Conversely, when we make a rapid eye movement called a saccade, we can also perceive 2D images when the flickering light array is fixed and the eyeball rotates fast enough. The retinal image drawn by the saccade is relatively the same as when the light array moves physically (see fig. 1b). Additionally, the shape of perceived images are different according to their own eye movements.

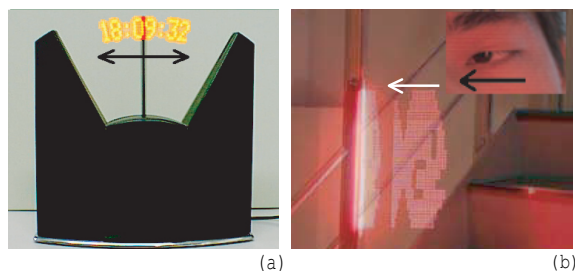


Figure 1: Information display device (a) based on a moving light array (ISM Inc. Fantazein) and (b) based on eye movements.

On performing art stages, audiences make eye movements at various times triggered by bodily actions and spot lights. If light arrays are flickering fast enough during the eye movements, the viewers can perceive 2D images, and the shape and width of the images are different among the viewers. We performed the interactive stages using four large LED arrays (1.8m in height). They are located behind the performers as in fig. 2a. The LED arrays function not only as illumination, but as a visual display, which can present different 2D images for each audience. The images perceived during

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eye movements are like in fig. 2b. We designed stage sets, images, sounds and choreography to effectively induce audiences' eye movements. Additionally, using this display, viewers can perceive the images on the performers' body, which are emanate from LEDs arranged behind the performers. This effect makes it possible for viewers to sense the depth, which are contrasts with real arrangement.



(a)



(b)

Figure 2: (a) Performers and LED arrays. (b) Perceived image during eye movement (we took this image by quickly rotating video camera, so stage performers appear smeared).

## 2 Conclusion

Using the saccade-based display, the audience can perceive different images from what physically exists on the stage. The display enables the illusory interactive performance based on audiences' eye movements, and makes the stage an original experience for each audience.

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