

Aftereffect of Viewing Concave Curved Displays: Assessment of Individual Differences in Equilibrioception Performance and Effects of Viewing Angle

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Abstract

Emerging display technologies such as Flexible, Curved, and High-Resolution displays are becoming very sophisticated and are rapidly approaching practical use. In 2015, we found the curved-surface-aftereffect (CS-AE), and demonstrated clear individual differences when observing a large-size simulated curved display as shown in Figure [1]. We also investigated the relationship between CS-AE and stabilometry (i.e., sway of center of pressure/gravity) and clarified why clear individual differences exist [2]. To better understand CS-AE, this paper investigates the relationship between the individual differences in CS-AE and analysis of human visual system.

As a result, we clarified that the occurrence of CS-AE demonstrates a clear and strong personal difference, and that the people belonging to the AE group, approximately half of all, have well-developed equilibrioception (e.g., sense of balance) trained by daily sporting events allowing them to integrate their visual and gravity sensory systems flexibly while they perceive the CS-AE rigidly. Also, Binocular vision was not a necessary condition for the perception of CS-AE. This suggests that correct alignment information cues such as horizontal or vertical line segments, i.e., no directional distortion of line segments in the frontal parallel planes, are extremely important for perceiving the external world coordinate system by human beings adapted to natural environments.

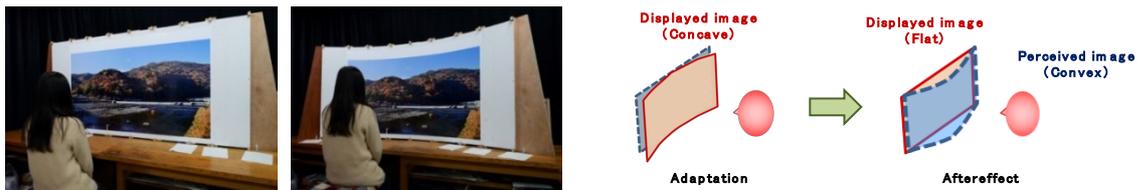


Figure. Simulated flat display (left) and curved display with 2.5m radius (middle) and schematic illustration of curved-surface-aftereffect (CS-AE) (right).

References

1. S. Ohtsuka, et al.: "Subjective Assessment of Simulated Curved Displays for Ultra-High-Definition TV in Large Size and Wide Viewing Angle Environment," SID 2015 DIGEST, vol. 46, issue 1, pp. 1274-1277, P-157L, 2015.
2. S. Ohtsuka, et al.: "Aftereffect of viewing concave curved displays in large and wide-angle environment: assessment of individual differences," SID 2016 DIGEST, vol. 47, issue 1, pp. 907-910, 66-3, 2016.

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