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Effect of character size and lighting on legibility of electronic papers

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Abstract

Effects of character size under ambient illuminances and light sources on legibility of electronic paper displays (electrophoretic display and cholesteric liquid crystal display) were studied and compared with paper. Sixty subjects participated in a letter-search task in the experiment. The results showed that search speed depends on the illuminance but not light source. Search speed increased as the illuminance increase from 300, 700 to 1500 lx. Search speed also increased with the increase of character size, from character height of 1.4 mm (9.6 min visual angle), 2.2 mm (15.1 min visual angle) to 3.3 mm (22.7 min visual angle), and the increase leveled off at 4.3 mm (29.6 min visual angle). The effect of character size on accuracy was also significant. Accuracy increased with the increase of character size. However, the effect of illuminance and light source on accuracy was not statistically significant. Based on the results of this study, it seems that E-paper displays may need greater illumination (700 lx or higher), greater character

size (3.3 mm or 22 min of visual angle).



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Keywords

Legibility; Electronic paper displays; Electrophoretic display; Cholesteric liquid crystal display; Letter-search task

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