# A Study for the Usability of Display of Hand-Held Devices


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**ABSTRACT**

This research investigated that the effects of four different display, Electronic-Paper Display (Cholesteric Liquid Crystal and Electrophoretic Electronic Ink Display) and Transmissive (Notebook) and Reflective LCD(PDA), to collocate random eight illuminance ,and use Landholt Rings to process visual performance experiment and subjective preference. Result of this research showed that the display 、illuminance and interaction between display and illuminance had significant effect on subjective visual performance. When illuminance was set as 3000、4500、5000lx have the best subject ’s visual performance ,the worst was set 50lx. Display was set as transmissive notebook have the best subjective visual performance, the worst was reflective LCD-PDA. In addition, when illuminance was set as 4500、5000lx have the best subjective preference, the worst was set as 50lx.Display was set as transmissive LCD-Notebook have the best subjective preference, the worst was reflective LCD-PDA. Experimental result to get Electrophoretic Electronic Ink Display is better than Cholesteric Liquid Crystal Display in the visual performance and subjective preference, in the visual performance Cholesteric Liquid Crystal Display polarized light and Electrophoretic Electronic Ink Display easy residues before a screen blur the shortcomings to cause Visual Performance on the ups and downs; If overcome this point, I believe it can be better results. Although transmissive LCD in the visual performance and subjective preferences are the best, but didn ’t have significant effect in ANOVA analysis and didn ’t found in bright environment, poorer quality images showed the state. Possibility because of higher screen brightness contrast lighting caused by the external environment; Reflective LCD is as expected in a bright environment, have better performance.



Keywords : Display、illuminance、visual performance、subjective preference


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