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Science, Mathematics

Summary and Synthesis of the Article, “ A Model of Scrolling of Touch Sensitive Displays”

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Summary

The article, “ A Model of Scrolling of Touch Sensitive Displays” essentially discusses the significance of conducting research on users’ behaviors while scrolling on touch sensitive displays. Zhao et. al. argue that although panning and flicking of touch sensitive displays are similar to traditional scrolling methods used on devices which do not possess touch sensitive displays, they, in essence, require a multi-step method that is not as simple as using indirect input techniques such as “ rolling the mouse wheel or dragging the mouse pointer” [8]. The authors note that users who use devices with touch sensitive displays tend to use “ panning” and “ flicking” techniques in a linear manner to reveal off-screen content. Therefore, in light of such behaviors and tendencies of users interacting with touch-sensitive displays, the authors attempt to provide findings from their empirical study which analyze user performance while conducting scrolling tasks on touch sensitive devices. The researchers acknowledge within their study that there have been solutions created to enhance the usability of touch sensitive devices such as “ Flick” and “ Superflick” [5, 8]. Reetz et. al indicate that “ Flick” both “ use a simple a stroke on the table surface to slide an object” [5]. However, the “ Superflick” facilitates the correction of an off-target move

done by the use of “ Flick” and allows the user to do a “‘ remote drag-and-drop’ to place the object on target” [5]. However, it should be noted that users are required to use multi-flick operations to locate the target on-screen. The researchers indicate that the study conducted by Aliakseyeu, et. al discovered that compound multi-flick (CMF) is the “ most preferred technique” by users of touch sensitive devices, and is just as effective (if not more effective than a scroll bar) [1]. Nevertheless, Zhao et. al. argue that there has not been a mathematical model used by the studies mentioned previously to illustrate the performance of users of touch sensitive devices. The authors imply in their study that there mathematical deductions would provide a “ solid theoretical framework” so as to accurately predict users’ performances in scrolling tasks and compare techniques using a “ base model” [8]. The results of this empirical study revealed that when Zhao et. al proposed and validated a quantitative model for the “ simplified and formalized scrolling tasks”, this model outperformed all other pre-existing models in most circumstances.

The main research challenges posed by the empirical study conducted by Zhao et. al include: the study will find it difficult to propose a model that represents the friction mechanism of an average touch sensitive device since each touch sensitive device may have a different “ friction mechanism” [8]. Presently, there is no study indicating which method for implementing a representational model to accurately measure and compare friction mechanism on a device.

The other research challenge that was posed by the empirical study

conducted is that the research only facilitated users who scrolled in a horizontal fashion rather than a vertical one. However, the researchers that horizontal and vertical scrolling motions are similar in nature in that a “ linear-repetitive motion is employed to accomplish motion toward the target” [8]. Zhao et al recognized that the model presented and validated by their empirical study would most likely be applicable to “ linear 2D peephole pointing” as well.

The other research challenge that was posed by the researchers is the lack of representation of all touch sensitive devices used by most persons in their daily lives, such tablets and mobile phones [8]. Zhao et al noted that only the Microsoft Surface was used during the conducting of the empirical study. The writers mentioned that it would have been significant to note the different ways that a user interacts with the different types of touch sensitive devices while observing how the user “ holds the devices, view angles, and display orientations” [8].

The topic studied by Zhao et al can be combined with the study conducted by Igarashi and Hinkley, who proposed a navigation technique for browsing large documents which combines “ rate-based scrolling with automatic zooming” [4]. This will be important research which will prove to be ground breaking for users of touch enabled devices. It should also be mentioned that due to the limited scrolling capabilities provided by the touch sensitive devices, individuals tend to shy away from reading large documents on such devices. The navigation tool provided by Igarashi and Hinkley could make these documents more easily navigable on these devices.

The compound multi-flick (CMF) proposed by Aliakseyeu et al will also

complement the studies conducted by Zhao et al since it was discovered by this study that the CMF was the preferred scrolling method used by those interacting with touch sensitive devices.

References

[1] Aliakseyeu, D., Irani, P., Lucero, A., & Subramanian, S. (2008). Multi-flick: An evaluation of flick-based scrolling techniques for pen interfaces . Florence: NSERC.

[2] Bartlett, J. (2000). Rock n' scroll is here to stay. IEEE Computer Graphics and Applications, 20(3), 40-45.

[3] Grossman, T., & Balakrishnan, R. (2005). A probalistic approach to modeling two-dimensional pointing. ACM Transitional Computer and Human Interaction, 12(3), 435-459.

[4] Igarashi, T., & Hinckley, K. (2000). Speed-dependent automatic zooming for browsing large douments. Proceedings of the ACM Symposium on User Interface Software and Technology , 1, 139-148.

[5] Reetz, A., Gutwin, C., Stach, T., Nacenta, M., & Subramanian, S. (2006). Superflick: a natural and efficient technique for long-distant object placement on digital tables. Proceedings of Graphic Interface , 1, 163-170.

[6] Ren, X., Kong, J., & Jiang, X. (2005). Sh-model: a model based on both system and human effects for pointing device evaluation. Information Processes and Society in Japan, 46(5), 1343-1353.

[7] Soukoreff, R., & MacKenzie, I. (2004). Towards a standard of pointing a device evaluation, perspectives on 27 years of fitts' law research. International journal of human computer studies, 61, 751-789.

[8] Zhao, J., Soukoreff, R. W., Ren, X., & Balakrishnan, R. (2014). A model of scrolling on touch sensitive devices. International journal of human computer studies, 72, 805-821. Retrieved October 7, 2014, from the Elsevier database.