CRITIQUE 1

Using Multiple Cursors to Assist Target Acquisition on Large Screens

INTRODUCTION & RESEARCH SUMMARY

The main motivation behind 'ninja cursors' is when there are multiple screens or very large screens, pointing to a distant target is difficult with the traditional point cursor. Having multiple synchronous cursors will allow the user to point to the target using the nearest cursor. This would decrease the distance between the cursor and target and also increase the overall performance of target acquisition in large screens. Target size, target density, cursor size, cursor density are important factors that determine the performance of pointing operations. Ninja Cursors focuses mainly on how the number of cursors would affect the performance of target acquisition tasks. Ninja cursors outperformed the traditional point cursor on screens which had sparse target density but was inefficient on high target density screens. Too many cursors also had a negative effect on performance and was visually distracting for the users.

WHAT I FOUND INTERESTING

The discussion section, which presents how the ninja cursor works in more practical contexts is what I liked the most. This section included very realistic scenarios where WIMP interfaces have regularly distributed targets or targets tend to form semantic clusters. The idea of having a dynamic adjustment of the cursor or having an extra cursor to point to the most likely target was also a key point to increase performance in target acquisition. The discussion also includes the difficulty with ninja cursors when specifying a region to select multiple targets. Switching to a single cursor mode or the resolving ambiguity by having implicit rules for the lasso tool were two smart solutions put forward in the paper. The future work stated as integrating the ninja cursor with other techniques (bubble cursor) interests me. This section of the research paper has thorough discussion about the limitations of the 'ninja cursor' to only indirect input devices such as mice, touch pads and trackballs. It also specifies future improvements to the technique of the ninja cursor to use priority queue as the waiting queue and hence increasing the performance when there are large number of cursors by decreasing the waiting time. I found the discussion section of the research paper very practical and informative.

WHAT I DISLIKED

The ninja cursor technique describes that the wall around a target is dynamically generated and the user should analyze the length of the wall to know the position of the cursor in the queue which might be confusing for the user. The user hence

should have prior knowledge of what each visual feedback represents. An easier representation would be to just include a number to find the cursor next in queue.The ninja cursor does not allow the user to have a free-flowing continuous movement of the cursor. Users like to have complete control over the system they are using and would dislike the cursor to become stuck repeatedly.

QUESTIONS

The paper states the future work would be to determine the decision time made by the user initially. How can we calculate and evaluate the decision time made by a user?
How could a user determine the best value for the number of cursors to be used so that it would serve the purpose of easy pointing to any target on the screen and also not have a negative effect due to a higher number of cursors? Would 2-8 cursors always be an ideal number for any screen?

CONCLUSION

The research paper proposed a new direction of improving performance of pointing to targets based on multiple cursors. Larger number of cursors and high target density would have a negative effect on the performance. Experiments show that ninja cursors have outperformed the traditional point cursors when there are 2-8 number of cursors used on large screens.

The paper apart from ninja cursor has also listed out different approaches such as bubble cursor, Delphian Desktop, area cursor, multi-monitor mouse which have been used to reduce the index of difficulty (ID) based on Fitt's Law. Each of these approaches have their own technique to modify the cursor's behavior to increase the width of the target or decrease the distance to the target. These approaches were new learning points for me.