Transparency for Item Highlighting

James Bowes David Dearman Ryan Perkins

Faculty of Computing Science
Dalhousie University

Abstract

In this paper, we introduce a system for reducing the visibility of infrequently used user interface items by increasing their transparency, thus increasing the visibility of frequently used items. We believe this system to be a superior alternative to the common method of completely removing infrequently used items from view. We discuss applications of this system to menus, toolboxes and desktop items, and issues associated with its implementation.

Keywords: Transparency, menu, toolbox, user interface design, desktop

1 Introduction

Menus, toolboxes and desktop items are used daily to provide the user with a great deal of selection. In many applications steps have been taken to reduce the number of options available to users with the goal of reducing the user's confusion regarding selection options. We propose a system where menu, toolbox and desktop items that experience infrequent use would increase in transparency making them less visible while not completely removing them from the screen.

The majority of user interface (UI) research relating to transparency deals with its application for overlapping items without obscuring them. Staples [5] observes that items with increased transparency are easily distinguishable from opaque ones. Therefore, rather than using transparency as a means of fitting more items on a screen, we propose to use transparency as an alternative to the common technique of hiding infrequently used items.

The inspiration for this topic comes from personalized menus in Microsoft Windows [3]. While personalized menus make frequently selected items more visible, they also completely remove less frequently used items from view (see Figure 1). These invisible items may become forgotten by the user. For example, if the user wants to perform a task that they perform infrequently, they may have forgotten that a menu item for that task exists. Some systems initially limit the user's selection choices by not revealing items until they have been used. To use these items the user would actively have to seek them out amongst the hidden selections. With our proposed technique, the user's initial selection will not be limited; the visibility of infrequently used items will be reduced, thus amplifying the visibility of frequently used items. This method also has the advantage of not repositioning any items; with personalized menus, the sizes of menus and the positions of items on them can change as items are revealed or hidden, making items slightly more difficult to find. Sears and Shneiderman [4] present another example of rearranging menu items based on usage frequency.

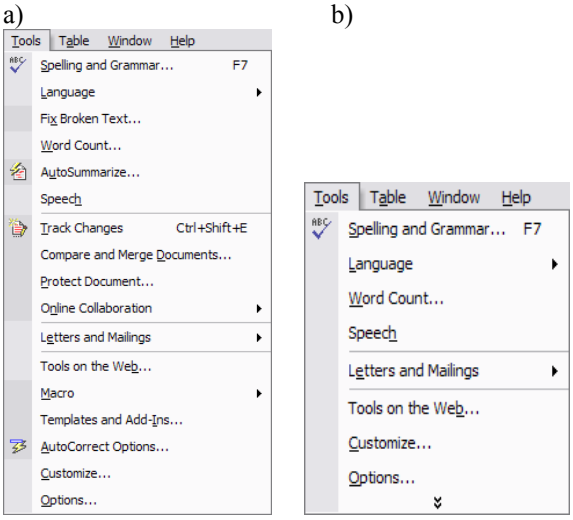

Figure 1. a) Regular Menu b) " Personalized" Menu

2 Application and Implementation

Our technique can be applied to a variety of user interface elements, including pull down menus, toolbox buttons and desktop icons. It is anticipated that the most effective use would be with menus and toolboxes, since the items in these components are adjacent (see Figure 2). The adjacency of the items and the application of transparency gives the effect of "holes" in the menu or toolbox. Icons, however, could potentially spread across the desktop, making it difficult to compare the relative transparencies of two icons. The effectiveness of this technique with desktop icons will be dependent on their arrangement by the user. Furthermore, this technique's effectiveness with desktop icons could be reduced by desktop backgrounds, which may contain

wide variations in color. An icon with a given level of transparency may look different depending on the intensity of the pixels behind it. One method of handling this is to decrease the transparency of an item when the mouse cursor passes over it. This will temporarily increase the visibility of the item to full opacity, allowing the user to better view it. Another option, in the case of menus, is to increase only the transparency of the background of the menu item, leaving the text fully opaque [2].

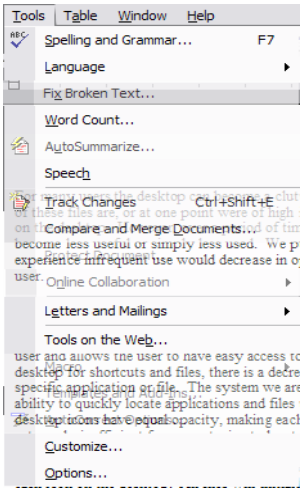

Figure 2. Menu with transparency

Experimental work by Harrison [1,2] has shown that the user's ability to process items does not begin to decrease significantly until the transparency level has been increased beyond 50%. However, Harrison's experimentation was performed using randomly placed items, thus ensuring transparency was the only factor. With our technique an item's location would not change as its transparency changed, thus incorporating other factors in addition to transparency. We believe the user's ability to remember and recall the placement of an item will allow for an increased maximum transparency above the 50% without drastically reducing their ability to locate an item. This is particularly the case with menus and toolboxes, where the "holes" created by transparent items will indicate the item's presence, whereas transparent desktop icons will have less of a noticeable presence.

There are three primary options for changing the transparency of an item: linearly, exponentially, or logarithmically. An item's usage history could be tracked to help determine how its transparency should be changed. For example, if an item with a long history of non-use were to see a burst of activity, its transparency might be decreased rapidly, then increased equally rapidly if the items falls back into disuse. Conversely, an item with a history of steady use should probably not see large changes in its transparency during unusual periods of use or disuse.

3 Conclusion

We believe that this method is an effective user interface technique. However, current research in this area is lacking. Further aspects of this technique that could be examined are: conducting experiments to determine the most effective scheme for altering the transparencies of various types of user interface items, using learning systems to develop optimal algorithms for determining how the frequency of usage of one user interface item should affect the transparency of other user interface items, and determining the best color schemes for the transparent user interface items with regards to the items below them, maximizing the clarity of the item.

Acknowledgements

We would like to thank Dr. Michael McAllister, Dr. Kori Inkpen and Karen Parker for their assistance in the production of this poster abstract.

References

[1] HARRISON, B.L. KURTENBACH, G. AND VINCENTE K. J. 1995. An Experimental Evaluation of Transparent User Interface Tools and Information Content. In *Proceedings of the 8th annual ACM symposium on User interface and s2oftware technology, UIST'95,* Pittsburg Pennsylvania, November 1995, ACM Press, New York, NY, 81-90.

[2] HARRISON, B. L. AND VICENTE, K. J. 1996. An experimental evaluation of transparent menu usage. In *Proceedings of the SIGCHI conference on Human factors in computing systems, CHI '96,* Vancouver, British Columbia, April 1996, ACM Press, New York, NY, 391–398.

[3] MICROSOFT CORPORATION. 2000. General User Productivity Improvements. Windows 2000 http://www.microsoft.com/windows2000/professional/evaluation/business/productivity.asp.

[4] SEARS, A. AND SHNEIDERMAN, B. 1994. Split menus: Effectively using selection frequency to organize menus. *ACM Trans. Comput. Human Interaction, 1*, 27–51.

[5] STAPLES, W. 1993. Representation in virtual space: visual convention in the graphical user interface. In *Proceedings of the SIGCHI conference on Human factors in computing systems, CHI '93*, Amsterdam, The Netherlands, April, 1993, ACM Press, New York, NY.