Event Review

From Voting Machines to "Scary": HCIL Celebrates Its 20th Anniversary

by Allen Rotz

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The Human Computer Interface Lab at the University of Maryland put on its 20th Annual Symposium and Open House on May 30. This daylong event was a report on and a celebration of the accomplishments at HCIL in the past year.

Each of the 17 reports was a quick 10-minute overview of a particular project plus time for a few questions. HCIL should be commended for keeping on schedule and the presenters for not running beyond their time slots.

The reports were grouped by topic into three sessions – two in the morning and one after lunch and cake to celebrate the 20th year. The symposium ended by mid-afternoon to allow ample time for the Open House where attendees could meet informally and talk to the faculty and students involved in each project. Everyone had a chance to individually manipulate the interfaces and experience the look and feel, even if they had to wait for the most popular ones.

HCIL was established just two years after the introduction of the first IBM PC – a time when computer interfaces had barely advanced from blinking lights and hexadecimal codes to still cryptic DOS commands on a monochrome CRT. HCIL is an innovator using interdisciplinary teams of faculty and students from computer science, psychology and library and information sciences to perform research and bring to commercial marketability well-designed interfaces that allow users to accomplish tasks quickly, efficiently, effectively and with a sense of confidence and accomplishment. Government and industry partner with HCIL on both theoretical research and projects that have specific, defined goals.

In the first morning session, chaired by Allison Druin, HCIL showed it does not limit its definition of human to adults but also includes children. The audience was wowed with two reports on the International Children's Digital Library – a five-year project to develop and test the best way of using technology to provide online access to children's books in a format designed to mimic the thought processes of a child rather than an adult. The actual software technologies are based on previous NSF-funded research conducted between 1999 and 2002 by HCIL to develop an interface to support 7-9-year-olds in querying, browsing and organizing multimedia information.

Two search methods are available and both are highly visual using zoom to move between the specific and the general. The first method shows a globe. The child clicks on a region and books from or about that region are displayed. The other method searches through 13 categories in a way that matches how a child would look for a book if actually present in a library. Working with children during the design, it was decided that books should be searchable by the color and shape of their covers as well as how they make children feel – e.g., whether it is a "scary" book or a "happy" book. Other categories include subject, type of characters and "true" or "make-believe."

Although the interface is particularly usable and flexible, its downside is its requirement that the PC be a minimum of a 700 MHz Pentium III, 256 MB RAM, operate with a Java Virtual Machine plug-in and have broadband access. Identifying this as a significant limitation, HCIL just announced the launch of an HTML-only version that will work over dial-up.

The other report related to the Children's Library was on an effort funded by a three-year NSF grant to analyze and expand functionality to meet the needs of children aged 10-13 years. The older kids rejected the "cute" design of the interface considering it too childish. They were interested in a "cool" interface, but there was a diversity of ideas as to what represented "cool." The solution was to provide a way for the older kids to customize the "skin" of the interface.

Younger children use the library for reading pleasure. Older kids need the additional functionality necessary for a school focus with reading for homework. With this expansion, a teacher can mark up a reading assignment, indicate which parts might be particularly important, attach a reading comprehension question via an electronic sticky note and the student can communicate questions and comments back to the teacher in a similar way. (Items 1, 2, and 3 in "For Further Reading")

The other report in this session also dealt with a non-traditional approach to information retrieval, "User Interaction in Speech and Video Retrieval: Relevance Judgment and Query Reformation." (Item 4)

Françoise Guimbretière chaired a session titled, "Devices Big and Small." The first report in this group was "A Fisheye Calendar Interface for PDAs: Providing Overviews for Small Displays." This software, running on Pocket PC PDAs (personal digital assistants), implements a ZUI (zoomable user interface) to address the problem of displaying information on a small hand-held device. (Item 5)

The last presentation of the morning was a report on a study to provide guidelines for the design of GUIs for young children. Four- and five-year-olds were measured in their ability to use a mouse to point to different size targets. Children of this group needed larger targets than older children or adults, thus verifying that interfaces must be designed specifically for young users. (Item 6)

Ben Shneiderman, founding director of HCIL, gave a lively intro for the afternoon session, "Information Understanding." The presentations given during this session had a common theme of using a computer to provide information in a manner that enables thinking and understanding. Symposium attendees received a copy of HCIL's just published book, The Craft of Information Visualization, a collection of 38 key papers on information visualization.

The only presentation that did not focus on improving visual display of information was one that evaluated the use of sound to convey geo-referenced data to blind users. This effort builds upon research in using non-

speech sound to provide to blind users the special relations of information arrayed in tables and menus. Some of the abilities and limitations of using non-speech sound with screen readers are presented in item 7 below.

A presentation whose topic is of potentially great effect on everyone was the summary of an HCIL study on the electronic (touch-screen) voting machines purchased by four Maryland counties in 2002. Ben Bederson, HCIL director, explained how the analysis focused on how easily and accurately voters could use the machines – a critical issue as small inaccuracies could change the results in close elections. Designers of voting machines face unique challenges. The machines

- must work for everybody (elderly, disabled, uneducated, etc.);
- are not frequently used; people walk up and use them with no required training; and
- should not require external help (although it is allowed)

Usability problems were identified and remedies were proposed. An array of information on electronic voting systems and the study's final report is at www.cs.umd.edu/~bederson/voting/umd-dre-report.pdf. See also item 8. See items 9-12 in the reference list for other reports included.

The last presentation was on "Piccolo," a new software toolkit for the design of interactive 2D graphics. It is claimed to be an improvement in every way over its predecessor Jazz, which is also from HCIL. It is based on the Java2D API and provides zooming (a particular feature of HCIL software) and multiple representation. Being open source it is available free at www.cs.umd.edu/hcil/piccolo/

The major theme at HCIL is the development of methods that allow humans to comprehend, analyze and understand multidimensional data when it is represented visually. The information-seeking mantra is overview first, zoom and filter, and then view details on demand. This procedure enables users to find what they need and understand what they find. It bridges the gap between what you know and what you need to know with the goal to make the benefits of information available to everyone.

HCIL demonstrated that it made many advances in the past year to achieve its goal – design, implement and evaluate novel interface technologies that are universally usable, useful, efficient and appealing.

Note: Several presentations have not been described because of both space limitations and a lack of additional online information relevant to these presentations.

For Further Reading

1. Druin, A., Bederson, B.B., Weeks, A., Farber, A., Grosjean, J., Guha, M.L., Hourcade, J.P., Lee, J., Liao, S., Reuter, K., Rose, A., Takayama, Y. & Zhang, L. (January 2003). *The International Children's Digital Library: Description and Analysis of First Use.* HCIL-2003-02, CS-TR-4433, UMIACS-TR-2003-04. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-02html/2003-02.pdf
2. Hourcade, J.P., Bederson, B., Druin, A., Rose, A., Farber, A. & Takayama, Y. (April 2003). *The International Children's Digital Library: Viewing Digital Books Online.* HCIL-2003-17, CS-TR-4473, UMIACS-TR-2003-43
3. Knudtzon, K., A. Druin, A. , Kaplan, N., Summers, K., Chisik, Y., Kulkarni, R., Moulthrop,S., Weeks, H. & Bederson, B. B. (April 2003). *Starting an Intergenerational Technology Design Team: A Case Study.* HCIL-2003-27. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-27html/2003-27.pdf
4. Kim, J., Oard, D.W. & Soergel, D. (In press). "Searching large collections of recorded speech: A preliminary study." To appear in the *Proceedings of ASIST 2003 Annual Meeting, October 19-22, 2003*, Long Beach, CA. HCIL-2003-06. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-06html/2003-06.pdf. See also http://www. clsp.jhu.edu/research/malach/
5. Bederson, B.B., Czerwinski, M. & Robertson, G. (May 2002). *A Fisheye Calendar Interface for PDAs: Providing Overviews for Small Displays*. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2002-09html/2002-09.pdf
6. Hourcade, J.P., Bederson, B.B., Druin, A. & Guimbretière F. (April 2003). *Accuracy, Target Reentry and Fitts' Law Performance of Preschool Children Using Mice.* HCIL-2003-16, CS-TR-4472, UMIACS-TR-2003-42. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-16html/2003-16.pdf
7. Zhao, H., Plaisant, C. & Shneiderman, B. (March 2003) *Improving Accessibility and Usability of Geo-referenced Statistical Data* HCIL-2003-11, CS-TR-4467, UMIACS-TR-2003-37. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-11html/2003-11.pdf
8. Bederson, B.B., Lee, B., Sherman, R., Herrnson, P.S & Niemi, R.G. (October 2002). Electronic Voting System Usability Issues. HCIL-2002-23, CS-TR-4414, UMIACS-TR-2002-94. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2002-23html/2002-23.pdf
9. Norman, K.L., Zhao, H., Shneiderman, B. & Golub, E. (In press). "Dynamic query chloropleth maps for information seeking and decision making." To appear in the *Proceedings of 10th International Conference on Human-Computer Interaction, 2003*. HCIL-2003-23. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-23html/2003-23.pdf
10. Kang, H., Plaisant , C. & Shneiderman, B. (2003). "New approaches to help users get started with visual interfaces: Multi-layered interfaces and integrated initial guidance." To appear in *Proceedings of the Digital Government Research Conference, Boston, May 2003*. HCIL-2003-10. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-10html/2003-10.pdf
11. Munzner, T., Guimbretiere, F., Tasiran, S.,Zhang, L. & Zhou, Y. (2003). *Tree Juxtaposer: Scalable Tree Comparison Using Focus+Context with Guaranteed Visibility.* http://www.cs.ubc.ca/~tmm/papers/tj/tj.camready.pdf
12. Kules, B., Shneiderman B. & Plaisant, C. (2003). "Data exploration with paired hierarchical visualizations: Initial designs of pair trees." To appear in the *Proceedings of the Digital Government Research Conference, Boston, May 2003*. See also http://www.cs.umd.edu/hcil/spacetree/ and http://www.cs.umd.edu/hcil/treemap/
13. Lee, B. & Bederson, B.B. (April 2003). *Favorite Folders: A Configurable, Scalable File Browser.* HCIL-2003-12. ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2003-12html/2003-12.pdf

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