

A Curse of Riches or a Blessing? Information Access and Awareness under Scarce Cognitive Resources

[Eric Horvitz](#)

Keynote

[Adaptive Hypermedia 2004](#)

Eindhoven, Netherlands

August 2004

The informational landscape of the world has been changing quickly. The fast-paced drop in the cost of storage and bandwidth over the last decade, coupled with the rapid expansion in the number of content sources, has made unprecedented quantities of information available to people. Beyond external sources of content, typical personal stores now rival the size of the entire Web just a short time ago. But we face a challenging bottleneck: In stark contrast to the explosive growth in public and private content, stands our limited time—and unchanging abilities. For increasing numbers of people in the world, the primary informational bottleneck is our scarce attentional and memory resources. I will present research on addressing such informational bottlenecks with tools for searching, browsing, remembering, and staying aware. I will review challenges and opportunities of employing automated learning and reasoning methods, including efforts to construct and leverage models of attention and memory. Finally, I will touch on the promise of developing new designs for interaction and display informed by psychological findings on visual attention and spatial memory.

References

- C.R. Anderson and E. Horvitz (2002). Web Montage: A Dynamic Personalized Start Page, *Eleventh International World Wide Web Conference*, Honolulu, Hawaii, May 2002. <http://research.microsoft.com/~horvitz/montage.htm>
- D. Azari, E. Horvitz, S. Dumais, E. Brill (2004). Actions, Answers, and Uncertainty: A Decision Making Perspective on Web-Based Question Answering, *Information Processing and Management*, Elsevier.
- S.T. Dumais, E. Cutrell, E., J.J. Cadiz, G. Jancke, R. Sarin and D.C. Robbins (2003). Stuff I've Seen: A system for personal information retrieval and re-use. *SIGIR 2003*. <http://research.microsoft.com/~sdumais/SISCore-SIGIR2003-Final.pdf>
- E. Gabrilovich, S. Dumais, E. Horvitz (2004). NewsJunkie: Providing Personalized Newsfeeds via Analysis of Information Novelty, *Thirteenth International WWW Conference*, New York. <http://research.microsoft.com/~horvitz/newsjunkie.htm>
- E. Horvitz, A. Jacobs, D. Hovel (1999). Attention-Sensitive Alerting, Proceedings of UAI '99, *Conference on Uncertainty and Artificial Intelligence*, July 1999, Morgan Kaufmann Publishers: San Francisco. pp. 305-313. <http://research.microsoft.com/~horvitz/attend.htm>
- E. Horvitz, C. M. Kadie, T. Paek, D. Hovel (2003). Models of Attention in Computing and Communications: From Principles to Applications, *Communications of the ACM* 46(3):52-59. <http://research.microsoft.com/~horvitz/cacm-attention.htm>
- E. Horvitz and J. Apacible (2003). Learning and Reasoning about Interruption. *Fifth ACM International Conference on Multimodal Interfaces*, November 2003, Vancouver, BC, Canada. <http://research.microsoft.com/~horvitz/learninterrupt.htm>
- M. Ringel, E. Cutrell, S. Dumais, E. Horvitz (2003). Milestones in Time: The Value of Landmarks in Retrieving Information from Personal Stores. *Interact 2003: Ninth International Conference on Human-Computer Interaction*, September 2003, Zürich, Switzerland. <http://research.microsoft.com/~horvitz/landmark.htm>
- E. Horvitz, S. Dumais, P. Koch. Learning Predictive Models of Memory Landmarks, *CogSci 2004: 26th Annual Meeting of the Cognitive Science Society*, Chicago, August 2004. <http://research.microsoft.com/~horvitz/learnmem.htm>
- G. Robertson, E. Horvitz, M. Czerwinski, P. Baudisch, D. Hutchings, B. Meyers, D. Robbins, G. Smith (2004), Scalable Fabric: A Flexible Representation for Task Management, *Advanced Visual Interfaces, AVI 2004*, Gallipoli, Italy, May 2004. http://research.microsoft.com/~horvitz/scalable_fabric.pdf

M. van Dantzich, D. Robbins, E. Horvitz, M. Czerwinski (2002), Scope: Providing Awareness of Multiple Notifications at a Glance, In: Proceedings of AVI 2002, *Advanced Visual Interfaces, AVI 2002*, Trento, Italy, May 22-24, 2002. ACM Press. <http://research.microsoft.com/~horvitz/scope.htm>

I. Zukerman and E. Horvitz. Using Machine Learning Techniques to Interpret WH-questions. *Proceedings of Association for Computational Linguistics (ACL-2001)*, Toulouse, France, July 2001. <http://research.microsoft.com/~horvitz/acl01.htm>