

# Suresh K. Bhavnani

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## Professional Goal

To develop effective computer applications based on the network analysis and visualization of complex datasets, and cognitive analysis of the difficulties users encounter while performing information-intensive tasks, with a focus in the biomedical domain.

## Education

Carnegie Mellon University

**Ph.D. in Computational Design and Human-Computer Interaction (HCI)**, 1998.

University of California at Los Angeles

**Master of Architecture** (Specialization in Computer-Aided Design).

University of Bombay

**Bachelor of Architecture** (Specialization in Design).

## Professional Experience

**Research Assistant Professor:** Medical School, University of Michigan (2008-present).

**Assistant Professor in HCI:** School of Information, University of Michigan (2000-2007).

### *Analysis of Biomedical Data*

- **Network Visualization and Analysis of Public Health Databases** (*Provided by the National Library of Medicine*). Used networks to visualize and analyze toxic chemicals and acute symptoms. The results led to the design of algorithms and interfaces to help first-responders rapidly identify toxic chemicals in emergencies. (*Distinguished Paper Award, American Medical Informatics Association*).
- **Scatter of Healthcare Information on the Web.** Analyzed patterns in the scatter of healthcare information on the Web. The results led to search strategies for finding comprehensive healthcare information, and to a model to explain how information scatter occurs over time.

### *Analysis of Users Performing Complex Biomedical and Healthcare Tasks*

- **Semi-structured interview of biomedical researchers.** Analyzed the needs of 30 junior and senior researchers to conduct effective translational and clinical science. The results led to the design of a prototype for a research portal, which enables more effective use of human and computational biomedical resources.
- **Cognitive Analysis of Expert and Novice Search Strategies** (*in Collaboration with Healthcare Search Experts*). Analyzed the domain-specific search strategies used by experts and novices to find online healthcare information. The results led to strategies needed by novice searchers to find accurate healthcare information.
- **Ethnographic study of Patent Searchers** (*in Collaboration with IBM*). Analyzed the collaborative search and sensemaking activities between patent searchers (in a tech transfer office), and inventors. The results led to design requirements for a system to support collaborative search and sensemaking.

### *Design and Evaluation of Systems to Support Complex Healthcare Tasks*

- **Design and Usability of StrategyHub for Cancer Patients** (*in Collaboration with Physicians at the University of Michigan*). Developed and evaluated the *StrategyHub* which provides expert search strategies to help novice searches find comprehensive healthcare information. The results led to design guidelines for providing online search procedures.
- **Design and Evaluation of MAIDN** (*World Usability Day Award*). Developed and evaluated GoogleBuddy to help users share and learn effective search strategies. The results led to insights for providing online search knowledge.

**Product Manager and Developer of AI CAD Applications:** Intergraph Corporation (1984-1991).

- **Design and Management of Knowledge-Based System for Engineering Design.** Managed the design, development and marketing of *ExpertTutor*. The project involved interviewing finite-element modeling experts, formalizing their knowledge, and building the knowledge base and interface using object oriented programming.
- **Development of CAD Software.** Developed software for 2-D and 3-D features in MicroStation (a high-end CAD application). The features were developed, tested, and released in a production cycle.

**Post-Doctoral Fellow:** Human-Computer Interaction Institute, School of Computer Science, Carnegie Mellon University (1998-2000).

- **Cognitive Modeling of Real-World Computer Interactions.** Used computational GOMS models to identify the knowledge required to use complex CAD systems. The results led to the design of *Strategy-Based Instruction*, which has been used to teach effective and efficient strategies in 3 universities to almost 400 students.

## Technical Skills

**Understanding Users and Evaluating Systems.** Over 10 years experience in identifying user needs and evaluating system interactions through the use of techniques from HCI, Anthropology, Educational Psychology, and Information Science.

**Management and Development of Systems.** Experience in managing and developing commercial and prototypical computer applications.

**Interdisciplinary Collaboration.** Initiated and led research collaborations and publications with anthropologists, cognitive psychologists, computer scientists, physicians, and engineers.

**Written and Spoken Communication.** Over 40 journal and conference publications including 6 long paper publications and presentations at the ACM SIGCHI conference. Research funded by NSF, Microsoft, and the University of Michigan.

**Teaching HCI and Search.** High teaching scores in courses including *HCI Evaluation Methods*, and *Search and Retrieval* at the University of Michigan.

## Select Publications (52 publications with pdfs available at <http://www-personal.si.umich.edu/~bhavnani/publications.html>)

**Bhavnani, S.K.**, and John, B.E. The Strategic Use of Complex Computer Systems. *Human-Computer Interaction* 15 (2000), 107-137.

**Bhavnani, S.K.**, Bichakjian, C.K., Johnson, T.M., Little, R.J., Peck, F.A., Schwartz, J.L., and Strecher, V.J. Strategy Hubs: Next-Generation Domain Portals with Search Procedures. *Proceedings of CHI'03* (2003), 393-400. New York: ACM.

**Bhavnani, S.K.** Why is it Difficult to Find Comprehensive Information? Implications of Information Scatter for Search and Design. *Journal of the American Society for Information Science and Technology* 56, 9 (2005), 989-1003.

Adamic, L.A., **Bhavnani, S.K.**, and Xiaolin, S. Scatter Networks: A New Approach for Analyzing Information Scatter on the Web. *New Journal of Physics (Special Issue on Complex Systems)* 9 (2007) 231.

**Bhavnani, S.K.**, Peck, F.A., Reif, F. Strategy-Based Instruction: Lessons Learned in Teaching the Effective and Efficient Use of Computer Applications. *ACM Trans. on Computer Human-Interaction* 15,1 (2008) 2:1-2:43.

## Awards and Invited Positions

**Awards.** AMIA Outstanding Paper, 2009; AMIA Distinguished Paper Award, 2007; UROP Outstanding Research Mentorship Award, Honorable Mention, 2008; Top Poster Award, World Usability Day Conference, 2008.

**Co-chair** with Ed Chi (PARC) and Wendy Kellog (IBM), Human-Computer Interaction Consortium (HCIC) Workshop (2007).

**Editorial Advisory Board.** Encyclopedia of Library and Information Sciences (2007).

**Journal and Conference Reviewing.** Cognitive Science (2007), SIGCHI (2001-2007), TOCHI (1999, 2007), TOIS (2008), HCI (2003, 2006), JASIST (2003, 2006), IP&M (2005), JMIR (2003), AMIA (2003).

**Grant Reviewing.** NSF (2002, 2006).