

## Curriculum Vitae

### **Bruce R. Schatz**

Department of Medical Information Science  
Institute for Genomic Biology  
University of Illinois at Urbana-Champaign  
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#### **RESEARCH INTERESTS**

Biomedical Informatics, Healthcare Infrastructure, Information Infrastructure

#### **PRESENT POSITIONS**

*University of Illinois at Urbana-Champaign, 1993-*

##### **Director, Community Architectures for Network Information Systems**

(CANIS) Laboratory 1993-

*(changed name from Community Systems Laboratory to CANIS in 1996  
when became a campus-wide Research Resource, see <http://www.uiuc.edu/research/> )*

Director, Digital Library Research Program (DLRP), University Library, 1996-1997

*(moved CANIS to 6000 sq. ft. stand-alone building in 1997 with state-of-the-art  
computing and network infrastructure, moved into new GSLIS building in 2001)*

**Interim Head, Department of Medical Information Science, Regional College of  
Medicine, 2005-** (small medical school hosting campus-wide MD/PhD program)

##### **Professor, Graduate School of Library and Information Science (GSLIS)**

*(came as Associate Professor in 1993; promoted to Professor in 1998)*

Joint in Department of Computer Science, Program in Neuroscience,  
School of Biomedical and Health Information Sciences (UI Chicago)

##### **Head, Graduate Studies, Illinois Informatics Institute (I3), 2007-**

*(chair of campus-wide committee to start new interdisciplinary PhD program)*

##### **Senior Research Scientist, National Center for Supercomputing Applications (NCSA)**

*(the scientific advisor on the NCSA Mosaic project, 1993-1995)*

**Resident Faculty, Institute for Genomic Biology (IGB), Neurogenomics Theme**  
Affiliate Faculty, Beckman Institute for Advanced Science and Technology

## PREVIOUS POSITIONS

### 2001-2003

**Visiting Professor**, Graduate School of Informatics, Kyoto University, Japan  
Aug 2001 – Jul 2002 (sabbatical), Jun-Aug 2003 (fellowship)

### 1991-1993

**Director**, Community Systems Laboratory, Arizona Research Laboratories  
**Assistant Professor**, Department of Management Information Systems  
**Assistant Scientist**, Department of Molecular and Cellular Biology

### 1989-1990

**Assistant Research Scientist**, Departments of Computer Science and  
Molecular & Cellular Biology, University of Arizona  
**Founding Director**, Computer & Genomic Systems Laboratory,  
Arizona Research Laboratories

### 1983-1988

**Technical Staff**, Network Systems Research Laboratory, Bellcore (Morristown NJ)  
creator/architect, Telesophy Prototype for large-scale information spaces

### 1980-1982

**Technical Staff**, Customer Systems Laboratory, Bell Laboratories (Holmdel NJ)  
chief architect, System/75 integrated communications development project

### 1977-1979

**Thesis research** in Computer Science, Carnegie-Mellon University  
under Dr. William Wulf, holding NSF graduate fellowship

### 1975-1977

**Thesis research** at MIT Artificial Intelligence Lab under Dr. David Marr  
research assistant first year, NSF graduate fellow second year

### 1976

**Graduate Student Associate**, Automatic Programming Group under Fran Allen  
IBM T.J. Watson Research Center, compiler construction (summer)

### 1975

**Graduate Student Associate**, Exploratory Technology Department under Kwan Wong  
IBM San Jose Research Laboratory, image processing (6 months)

### 1973-1974

**Research Staff**, Laboratory for Computer Science & Engineering under Edward Feustel  
Rice University (part-time) parallel computer simulation

## EDUCATION

### **University of Arizona, Postdoctoral Studies 1989-1990**

Department of Molecular and Cellular Biology under Dr. Samuel Ward  
*An Interactive Software Environment for Genomic Data of C. elegans*

### **University of Arizona, Ph.D. 1990**

major: Computer Science

minor: Molecular Biology

*Interactive Retrieval in Information Spaces*

*Distributed across a Wide-Area Network* under Dr. Scott Hudson

Dissertation available as UA Computer Science Dept, Tech Report 90-35, 95pp.

### **Carnegie-Mellon University, M.S. 1979**

major: Computer Science

minor: Cognitive Psychology

*Flow Analysis for Production-Quality Compiler Compilers* under Dr. William Wulf

### **Massachusetts Institute Technology, M.S. 1977**

major: Artificial Intelligence

minor: Neurophysiology

*Computation of Immediate Texture Discrimination* under Dr. David Marr

Thesis available as U.S. Government NTIS AD-A053-804.

reprint of MIT Artificial Intelligence Lab, Memo 426, 97pp.

### **Rice University, B.A. 1975**

majors: Mathematics, Mathematical Sciences

minor: (Cognitive) Psychology

Compiler Construction (Ken Kennedy), Artificial Intelligence (John Brelsford)

## HONORS

*Fellow, American Association for the Advancement of Science (AAAS), elected 2001*

*National Science Foundation / Japan Society for Promotion of Science*

Fellowship for US Researchers (to study in Japan), 2001-2002 (UIUC, Kyoto U)

JSPS Senior Invitation Fellowship, summer 2003 (Kyoto University)

*National Science Foundation Young Investigator award (NYI) 1992-1997 (UA, UIUC)*

*National Science Foundation Graduate Fellowship 1977-1979 (MIT, CMU)*

Honorable mention 1976 ACM Forsythe Student Paper Competition (Rice)

Honorable mention 1975 ACM Forsythe Student Paper Competition (Rice)

## SYSTEMS CONSTRUCTION AND PROPAGATION

### **Interspace Prototype, 1997-2000**

Full-scale experimental analysis environment with semantic indexes across sources.

**Nature** 419: 751-757 (17 October 2002) – “Bioinformatics: Bringing it all together”  
data integration for post-genome biology. several Schatz quotes

**Nature** 406 (6798): 822-825 (24 August 2000) – “Databasing the Brain”  
concept switching for database federation for neuroinformatics. several Schatz quotes.

**Science** 281: 1785 (1998) -- "Taming MEDLINE with Concept Spaces"  
computing semantic indexes for all of medicine for concept switching experiments.

### **Digital Library Project (DLI) 1994-1998**

Large-scale electronic library for engineering community of structured SGML documents.  
Testbed deployed to 2500 users around University of Illinois as standard service.

**Business Week** Aug 12, 1996 - "The Ultimate Indexing Job”

Schatz solving the indexing problem for the Internet with supercomputers.

**Science** 272: 1419 (1996) -- "Computation Cracks 'Semantic Barrier' Between Databases"  
vocabulary switching experiments on supercomputers by Schatz and Chen.

**Science** 269: 1354-1356 (1995) -- "Indexing the Internet"

Schatz as expert on information services for the Internet with many quotes.

**Science** 266: 20-22 (1994) -- "Turning an Info-Glut into a Library"

Illinois DLI as the model working testbed system. screendump of prototype.

### **Worm Community System (WCS) 1990-1993**

Nationwide electronic library for biology community with data, literature, and links.  
distributed copies of the software to 40 sites (university & research organizations).

**Science** 261: 841-843 (1993) -- "Beyond E-mail and Databases"

WCS as the model for electronic communities and collaboratories.

sidebar on Networking the Worm with screenshot and photo of Schatz.

**Science** 258: 1873 (1992) -- WCS as the model for Databasing the Brain.

**Science** 254: 207 (1991) -- WCS as the future of Genome Databases.

WCS referenced as model for science information systems in:

**Mapping the Brain and its Functions** (Institute of Medicine, 1991, pp87-88) and in

**Building National Collaboratories: Applying Information Technology for Scientific Research** (National Research Council, 1993, pp52-54).

### **Telesophy System 1984-1989**

Distributed multimedia information retrieval and storage transparently across a network.  
copies of the software to 45 sites (university & research organizations).

### **Personal Communications System (PCS) 1980-1983**

Integrated office automation including electronic mail and calendar services.  
distributed copies of the software to more than 300 sites (Bell Labs & Bellcore).

### **INVITED POLICY MEETINGS**

National Research Council, committee member of Computer Science Board (CSTB) study  
*National Collaboratories: Applying Information Technology for Scientific Research*,  
National Academy Press, Mar 1993, 105pp. (study 1991-93)  
chair of Task Force on Applications in Molecular Biology.

### **Information Infrastructure**

National Science Board, governing body of NSF, invited workshop for study report on Long-Lived Data Collections (LLDC), gave concluding invited talk on data archiving, Mar 2004.  
NSF workshop on Research Directions in Digital Libraries, to recommend establishing a permanent program in digital library research and infrastructure, Cape Cod MA, Jun 2003.  
Rice University, appointed by University President to External Review Committee on the Digital Environment (CODE) (Strategic Planning for Information Technology), Mar 2001.  
Rice University Library, appointed by University President to 3-year term on Advisory Board, 1998-2000. Gave invited public lecture on future of information technology in March 1998.  
NSF workshop hosted by NRC (National Research Council) on Advancing the Public Interest through Knowledge and Distributed Intelligence (KDI), Washington, Sep 1997.  
The only invited speaker on technology (revolutionary systems for the public interest) to meeting of the entire NSF hierarchy and key directors from major foundations.  
NSF Planning Workshop for Knowledge Networks portion of KDI (Knowledge and Distributed Intelligence) Initiative, Boulder, CO, Apr 1997.  
NRC (National Research Council) workshop on Computing and the Humanities, Washington, Mar 1997. The lead technology speaker (systems useful for humanities).  
NISO (National Information Standards Organization) Board meeting, Chicago, Mar 1997.  
The featured speaker and advisor on future directions for digital libraries.  
NSF Planning Workshop for Digital Libraries Initiative II, Santa Fe, Mar 1997.  
Invited speaker on Structural Issues (major section of final report) and chair of 1 of 4 working groups.  
Middleware workshop, ACM SIGCOMM Special Interest Group on Communications, Boston, Aug 1995. Invited expert.  
DARPA Principal Investigator meetings, ITO Information Technology Office, Ft. Lauderdale, FL, Jul 1995; Palo Alto, Jan 1996; San Diego, Oct 1997; Honolulu, Oct 1998; San Diego, Nov 1999.

*America in the Age of Information: A Forum on Federal Information and Communications R&D*, CIC (Committee on Information and Communications) which reports to Science Advisor to the President of the United States), National Library of Medicine, Jul 1995.

White paper accepted by program committee, Invited talk on Information Infrastructure.

Digital Library Research Agenda workshop, *IITA (Information Infrastructure Technology and Applications)*; highest level technical federal NII committee), Falls Church, VA, May 1995.

Chair of Library Perspective working group (1 of 5). author of report section and suggestor of the Grand Challenge.

Digital Library Initiative (DLI) project-wide workshop, Urbana, IL, Apr 1995.

Chair and host for local arrangements. also chair of DLI coordinating committee.

Council on Library Resources and Welch Medical Library, Invitational Symposium on Knowledge Management, West Virginia, Oct 1991.

Internet Activities Board, workshop on Future of Internet Architecture, San Diego, Jun 1991.

Member at large, Internet Research Task Force (esp Electronic Communities).

## **Biomedical Databases**

National Science Foundation, Office of Integrative Activities, Workshop on Frontiers in Neuroscience, Brain Science as a Mutual Opportunity for the Physical and Mathematical Sciences, Computer Science, and Engineering, Arlington VA, Mar 2007.

External Advisory Board, National Center for Integrative Biomedical Informatics, University of Michigan grant in NIH Roadmap award for National Centers for Biomedical Computing. Sep 2005-

National Science Foundation NSF/USDA Workshop on the Future of Plant Genome Databases, Washington DC, Sep 2001. invited white paper on Database Structures and Interoperability entitled "Building a Global Environment for Functional Analysis of Plant Genomes".

National Research Council, Board on Biology, invited speaker at Bioinformatics Workshop, Washington DC, Feb 2000.

National Science Foundation, Division of Biological Infrastructure, 1 of 5 members of Committee of Visitors who performed 3-year strategic review of computational biology and biological database programs, May 1999.

National Library of Medicine, panel to review Director of NLM for Director of NIH.

1 of 5 members of high-level evaluation committee chaired by President of Institute of Medicine, Mar-Aug 1997.

National Science Foundation, workshop on Databases for Identifiable Neurons, Jun 1994.

National Institute of Mental Health, Human Brain Project workshop (information technology for neuroscience research), Invited keynote speaker, Washington, April 1992.

National Institutes of Health, workshop on Drosophila Databases, Washington, Dec 1990.

Institute of Medicine, task force for Study to recommend establishing National Brain Mapping Databases, Washington, Jan 1990.

National Science Foundation, Division of Biological Infrastructure, workshop to advise NSF on starting a multidisciplinary Program in Computational Biology, Washington, Dec 1989.

National Center for Biotechnology Information, workshop on Laboratory Informatics for the Human Genome Project, Washington, Oct 1989.  
National Science Foundation, workshop on E. coli Databases, Chicago, Jun 1989.

## GRANTS AND FUNDING

- Bruce Schatz (PI), Gene Robinson, ChengXiang Zhai, Sandra Rodriguez-Zas, Bertram Bruce, Susan Fahrback (2004) BeeSpace – An Interactive Environment for Analyzing Nature and Nurture in Societal Roles, *NSF FIBR Frontiers in Integrative Biological Research*, Biological Sciences Directorate-wide competition, Grant 0425852 awarded \$4,987,688 for period Sep 1, 2004 to Aug 31, 2009.
- B. Schatz (2001) Trends in Information Infrastructure, *NSF International Programs: East Asia and Pacific Programs*. INT-0118151. *JSPS (Japan Society Promotion Science) Short-term Fellowship for US Researchers*, in support of Visiting Professor position at Kyoto University to research a book. Awarded \$8768 as supplement from NSF for period Aug 2001 to Jul 2002. Total is approx US \$57,000 including stipends from JSPS in yen.
- B. Schatz (PI), C. Herring, H. Chen (1997) The Interspace Prototype: An Analysis Environment for Semantic Interoperability, *DARPA Information Management program within ITO (Information Technology Office)* within DARPA for BAA 97-09: Collaboration, Visualization, and Information Management Technology (CVIM). Awarded \$3,396,300 for period Jul 1997 to Jun 2000. Supplement (1998) for technology transfer to ISI awarded \$294,000 in June 1998 with Schatz (PI) and L. Jackson.
- B. Schatz (PI), A. Bishop, W. Mischo, J. Hardin (1994) Building the Interspace: Digital Library Infrastructure for a University Engineering Community. IRI-94-11318COOP. Awarded \$4,000,000 from *NSF IRIS-CISE in NSF/ARPA/NASA Digital Library Initiative (DLI)* for the period Sep 1994 to Aug 1998. role is head of project and head of research. Supplement (1995) for image processing research and NSF demo equipment adds \$157,571. Supplement (1996) for DLI project-wide coordination (publications, testbeds) adds \$205,467 for the period Sep 1996 to Aug 1997. Supplement (1997) adds \$55,108 through Aug 1998. Supplement (1998) adds \$49,606 for national DLI coordination through Feb 1999. Supplement (1999) adds \$172,384 for national DLI-2 coordination through Aug 2001. Additional Matching funds of \$400,000 from the university and supporting organizations.
- B. Schatz and E. Johnson (1998) Building a Multiple View Client for NCI Information Sources, *National Cancer Institute - Science Information Systems*, awarded as supplement to NSF DLI grant, \$123,000 for period Nov 1998 to Oct 1999.

- B. Schatz (1996) Semantic Retrieval of Cancer Literature, funded by *National Cancer Institute (NCI) - International Cancer Information Center (ICIC) at NIH*. grant processed through *NSF DASC as part of the NCSA Federal Consortium ASC93-15256*. Awarded \$143,100 for period Jul 1996 to Jun 1997.  
 Supplement (1997) Continuation grant funded as supplement to NSF DLI grant (with monies provided by NCI-NIH). Awarded \$226,316 for period Sep 1998 to Aug 1999.
- B. Schatz (1997) Planning Grant for DLI-II Cancer Information Testbed, from R.K.D. Haussmann, *Vice Chancellor for Health Services, University of Illinois at Chicago*. Awarded \$200,000 for 2 years starting April 1997 as seed monies.
- W. Kubitz (PI) and B. Schatz (1995) *Hewlett-Packard Recipient-Enhanced Grant (REG) 24964*, \$1,229,357, computer equipment purchased at 20% of list. Schatz was PI of DLI portion constituting \$402,468 of HP computer equipment for GSLIS, Library, NCSA.
- M. Folk (PI), R. Wilhelmson, M. Ramamurthy, R. Crutcher, M. Winslett, N. Yeager, B. Schatz (1994) Test Applications and Digital Library Technologies in Support of Public Access to Earth & Space Science Data, *NASA HPCC program CAN*, Awarded \$2,267,241 for the period Oct 1994 to Sep 1997. role is head of information systems research.
- B. Schatz (1994) Building an Electronic Scientific Community, *NSF BIO Div of Biological Instrumentation and Resources*, BIR-93-19844. Awarded \$268,878 total cost for period Mar 1994 to Feb 1996. continuation of support for WCS project (two separate supplements).
- M. Gabriel (PI), A. Feng, B. Schatz, R. Gillette, W. Greenough (1992) A Database System for Neuronal Pattern Analysis, *NSF BIO Div of Biological Instrumentation and Resources DBI-91-16763*. Continuing Award \$265,000 total cost for period Jun 1992 to Nov 1995. role is as neuroinformatics faculty.
- B. Schatz (1992) *NSF Young Investigator award* in science information systems (NYI formerly PYI), IRIS-CISE IRI-9257252. Awarded \$25,000 total cost per year (up to \$62,500 with industrial matching funds) for the period September 1992 to August 1998. Total awarded with matching is \$316,973, includes matching from Hewlett-Packard and Apple Computer. the most prestigious faculty fellowship.
- B. Schatz (PI), S. Hudson, L. Peterson, and S. Ward (1990) Systems Technology for Building a National Collaboratory, *NSF CISE Special Initiative on Coordination Theory and Collaboration Technology IRI-9015407*. Awarded \$1,292,689 total cost for period September 1990 to August 1993. includes educational supplements.  
 (separate proposal as PI with S. Ward, Building an Electronic Scientific Community, *NSF BIO Division of Instrumentation and Resources DIR-9004070*, was approved in 1990 as a \$1.8 million 5 year proposal but placed on administrative hold in deference to this grant)

B. Schatz (1989) Designing a Computer System to Support an Electronic Scientific Community, *NSF Small Grants for Exploratory Research (SGER)*, BBS Division of Instrumentation and Resources DIR-9003540. Awarded \$43,920 total cost for the period May 1990 to April 1991 from the BBS Division of Instrumentation & Resources.

## PUBLICATIONS

- D. Maduram and B. Schatz (2008) *Monitoring Full-Spectrum Health with Quality of Life Questionnaires*, **Health Affairs**, 10pp, submitted.
- X. He, B. Chee, M. Sen Sarma, C. Zhai, B. Schatz (2008) *Gene Annotation via Statistical Concepts from Biomedical Literature*, **Bioinformatics**, 10pp, submitted.
- X. Ling, J. Jiang, Q. Mei, X. He, C. Zhai, B. Schatz (2007) *A Study of Semi-structured Summarization: Generating Gene Summaries from Biomedical Literature*, **Information Processing & Management** 43: 1777-1791.
- R. Berlin and B. Schatz (2005) *The Inevitable Evolution of Healthcare Infrastructure*, **Medscape General Medicine (MedGenMed)**, 11 sections (22pp), under second revision to appear shortly, [www.medscape.com](http://www.medscape.com) .
- B. Schatz (2002) *Building Analysis Environments: Beyond the Genome and the Web*, **IEEE Intelligent Systems**, invited essay for Trends and Controversies section on Mining Information for Functional Genomics, 17: 70-73 (May/Jun).
- M. Itagaki, R. Berlin, and B. Schatz (2002) *The Rise and Fall of E-Health: Lessons From the First Generation of Internet Healthcare*, **Medscape Technology in Medicine (MedTechMed)**, 2(1), April 2002, 20pp (ejournal), [www.medscape.com](http://www.medscape.com) .
- B. Schatz (2002) *The Interspace: Concept Navigation across Distributed Communities*, **IEEE Computer**, Information Infrastructure article for annual issue on Technology Trends, 35: 54-62 (Jan).
- R. Berlin and B. Schatz (2001) *Monitoring of Quality of Life for Congestive Heart Failure Populations*, **Congestive Heart Failure**, invited article, Jan/Feb, 7(1): 13-23.
- B. Schatz (2000) *High-Performance Digital Libraries*, **Cluster Computing**, invited article.
- A. Houston, H. Chen, B. Schatz, R. Sewell, T. Doszkocs, D. Ng (2000) *Exploring the Use of Concept Space and Category Map Techniques to Improve Medical Information Retrieval*, **Decision Support Systems**, Special Issue on Decision Support for Health Care in a New Information Age, 30(2): 171-186 (Dec).
- A. Houston, H. Chen, S. Hubbard, B. Schatz, D. Ng, R. Sewell, K. Tolle (1999) *Medical data mining on the Internet: Research on a cancer information system*, **Artificial Intelligence Review** 13(5): 437-466 (Dec).
- R. Berlin and B. Schatz (1999) *Internet Health Monitors for Outcomes of Chronic Illness*, **Medscape General Medicine (MedGenMed)**, 6 sections (12pp), Sept 2, 1999, [www.medscape.com](http://www.medscape.com) .

- M. Ramsey, H. Chen, B. Zhu, and B. Schatz (1999) *A Collection of Visual Thesauri for Browsing Large Collections of Geographic Images*, **J. American Soc Information Science** (JASIS), 50(9): 836-844.
- B. Schatz and H. Chen (1999) [\*Digital Libraries: Technological Advancements and Social Impacts\*](#), **IEEE Computer**, Guest Editors Introduction to Special Issue on Digital Libraries, 32: 45-50 (Feb).
- B. Schatz, W. Mischo, T. Cole, A. Bishop, S. Harum, E. Johnson, L. Neumann, H. Chen, D. Ng (1999) [\*Federated Search of Scientific Literature\*](#), **IEEE Computer**, Special Issue on Digital Libraries, 32: 51-59 (Feb).
- H. Chen, A. Houston, R. Sewell, and B. Schatz (1998) *Internet Browsing and Searching: User Evaluations of Category Map and Concept Space Techniques*, **J. American Soc Information Science** (JASIS), 49(7): 582-603.
- H. Chen, J. Martinez, A. Kirchhoff, T. Ng, B. Schatz (1998) *Alleviating Search Uncertainty through Concept Associations: Automatic Indexing, Co-occurrence Analysis, and Parallel Computing*, **J. American Soc Information Science** (JASIS), 49(3): 206-216.
- B. Schatz (1997) [\*Information Retrieval in Digital Libraries: Bringing Search to the Net\*](#), **Science** 275 :327-334 (Jan 17). invited lead article for special issue on Bioinformatics. also designed cover of issue and prepared image with H. Kellner.
- H. Chen, J. Martinez, T. Ng, and B. Schatz (1997), *A Concept Space Approach to Addressing the Vocabulary Problem in Scientific Information Retrieval: An Experiment on the Worm Community System*, **J. American Soc Information Science** (JASIS), 48(1): 17-31 (Jan).
- H. Chen, B. Schatz, D. Ng, J. Martinez, A. Kirchhoff, C. Lin (1996) *A Parallel Computing Approach to Creating Engineering Concept Spaces for Semantic Retrieval: The Illinois Digital Library Initiative Project*, **IEEE Trans Pattern Analysis & Machine Intelligence** 18 (8): 771-782 (Aug), special issue on Digital Libraries.
- C. Jamison, B. Mills, and B. Schatz (1996) *ENQUIRE: An Extensible Network Query Unification System for Biological Databases*, **Bioinformatics** 12(2): 145-150 (Apr).
- B. Schatz and H. Chen (1996) *Building Large-Scale Digital Libraries*, **IEEE Computer** 29:23-27 (May). Guest Editor's Introduction to Special Issue on Digital Libraries. (Schatz was co-editor)
- B. Schatz, W. Mischo, T. Cole, J. Hardin, A. Bishop, H. Chen (1996) [\*Federating Diverse Collections of Scientific Literature\*](#), **IEEE Computer** 29: 28-36 (May).
- H. Chen, B. Schatz, J. Martinez, T. Ng (1995) *Generating a Domain-specific Thesaurus Automatically: Experiments on FlyBase*, **Information Processing & Management**.
- B. Schatz (1995), *Building the Interspace: The Illinois Digital Library Project*, **Comm. ACM** 38: 62-63 (Apr).
- L. Shoman, E. Grossman, K. Powell, C. Jamison, B. Schatz (1995) *The Worm Community System, Release 2.0 (WCSr2)*, in H. Epstein & D. Shakes (eds), **C. elegans: Modern Biological Analysis of an Organism**, chap 26, **Methods in Cell Biology** 48: 607-625 (Academic Press annual special topic journal) [invited refereed article]
- H. Chen, B. Schatz, T. Yim, D. Fye (1995) *Automatic Thesaurus Construction for an Electronic Community System*, **J American Soc Information Science** (JASIS), 46(3): 175-193.

- B. Schatz and J. Hardin (1994) *NCSA Mosaic and the World-Wide Web: Global Hypermedia Protocols for the Internet*, **Science** 265: 895-901 (August 12). invited lead article for special issue on *Computers '94: Networks and Models*. designed cover; image by I. Kallick and B. Schatz (also poster for 2nd WWW Conf).  
letter, *World Wide Web and Molecular Biology*, *Science* 268: 622-23 (5 May 1995).
- <my lab> H. Chen (1994) *Collaborative Systems: Solving the Vocabulary Problem*, **IEEE Computer** 27: 58-66 (May). screendump of WCS, p63 fig 3.
- B. Schatz (1991) *Building an Electronic Community System*, **J. Management Information Systems** 8: 87-107 (Winter 1991-92). reprinted in R. Baecker (ed), **Readings in Groupware and Computer Supported Cooperative Work** (Morgan Kaufmann, 1993), pp 550-560 in Chapter 9 on Cooperative Hypertext and Organizational Memory.
- B. Leverett, R. Cattell, S. Hobbs, J. Newcomer, A. Reiner, B. Schatz, W. Wulf (1980) *An Overview of the Production-Quality Compiler Project*, **IEEE Computer** 13:38-49 (Aug).
- B. Schatz (1977) *Automated analysis of cryptograms*, **Cryptologia** 1:116-142 (Apr).  
Earlier version awarded honorable mention in 1976 ACM Student Paper Competition see **Comm. ACM** 19:490 (Sep 1976).

## Refereed Conferences

- X. Ling, J. Jiang, X. He, Q. Mei, M. Sarma, C. Zhai, G. Robinson, B. Schatz (2007) Gene Summarizer: Software for Automatically Generating Structured Summaries from Biomedical Literature, *2<sup>nd</sup> International Biocuration Meeting*, San Jose, California, Oct.
- B. Chee and B. Schatz (2007) Document Clustering using Small Worlds Communities, *Proc 7<sup>th</sup> ACM/IEEE Joint Conference on Digital Libraries (JCDL '07)*, Vancouver BC, June, 53-62.
- X. Ling, J. Jiang, X. He, Q. Mei, C. Zhai, and B. Schatz (2006) Automatically Generating Gene Summaries from Biomedical Literature, *Pacific Symposium on Bioinformatics*, Maui, Hawaii, Jan, 12pp.
- R. Berlin and B. Schatz (2002) The Evolution of Healthcare Infrastructure, *Economic and Social Implications of Information Technology*, NSF-sponsored workshop hosted by Center for Information Policy, University of Maryland, College Park, Feb, Oct.
- B. Schatz (2000) Digital Libraries for Community Knowledge: The Coming World of the Interspace, *Kyoto Int IEEE Conf on Digital Libraries*, Kyoto Japan, Nov, 455-466.
- C. Chang and B. Schatz (1999) Performance and Implications of Semantic Indexing in a Distributed Environment, *CIKM'99 (SIGIR/SIGMIS) 8th Int ACM Conf Information and Knowledge Management*, Kansas City, MO, Nov, 391-398.
- N. Bennett, Q. He, K. Powell, and B. Schatz (1999) Extracting Noun Phrases for All of MEDLINE, *AMIA '99 (American Medical Informatics Assoc) Annual Conf*, Washington, DC, Nov, 671-675. won **Best Theoretical Paper** award.
- Y. Chung, Q. He, K. Powell and B. Schatz (1999) Semantic Indexing for a Complete Subject Discipline, *4th Int ACM Conf on Digital Libraries*, Berkeley, CA, Aug, 39-48.

- B. Schatz (1998) [High-Performance Distributed Digital Libraries: Building the Interspace on the Grid](#) , invited paper, *7th IEEE Int Symp High-Performance Distributed Computing*, Chicago, July, 224-234.
- Y. Chung, W. Pottenger, and B. Schatz (1998) Automatic Subject Indexing using an Associative Neural Network, *3rd Int ACM Conf on Digital Libraries*, Pittsburgh, PA, Jun, 59-68. nominated for **Best Paper** award.
- B. Schatz, E. Johnson, P. Cochrane, H. Chen (1996) [Interactive Term Suggestion for Users of Digital Libraries: Using Subject Thesauri and Co-occurrence Lists for Information Retrieval](#), *1st Int ACM Conf on Digital Libraries*, Bethesda, MD, Mar., 126-133.
- R. Wilhelmson, M. Folk, M. Ramamurthy, R. Crutcher, M. Winslett, N. Yeager, and B. Schatz (1996) The Horizon Project: Test Applications and Digital Library Technologies in Support of Public Access to Earth & Space Science Data, *American Meteorological Society (AMS) Annual Meeting* , Feb.
- H. Chen, B. Schatz, C. Lin (1995) Concept Classification and Search on Internet Using Machine Learning Techniques, *World Wide Web 4 Conference*, Boston, Dec.
- A. Bishop, L. Star, L. Neumann, E. Ignacio, R. Sandusky, and B. Schatz (1995) Building a University Digital Library: The need for a user-centered approach, *Proc Monterey Conference on Higher Education and the NII: From Vision to Reality*, Coalition for Networked Information, Sep.
- B. Schatz (1995) [Information Analysis in the Net: The Interspace of the Twenty-First Century](#), *America in the Age of Information: A Forum on Federal Information and Communications R&D, National Library of Medicine*, Jul. sponsored by CIC (Committee on Information and Communications) reporting to the Science Advisor to the President of the United States.
- C. Jamison, B. Mills, and B. Schatz (1995) ENQUire: A Mosaic-based WWW Database Query Confederation System, *Meeting on the Interconnection of Molecular Biology Databases*, London, Jun.
- <my lab> L. Star and K. Ruhleder (1994) Steps towards an Ecology of Infrastructure, *ACM CSCW '94 (Computer Supported Cooperative Work)*, Chapel Hill, NC (Nov). *Information Systems Research* special issue on Organizational Transformations.
- H. Chen and B. Schatz (1994) Semantic Retrieval for NCSA Mosaic, *2nd World Wide Web Conference*, Chicago (Oct).
- B. Schatz, A. Bishop, W. Mischo, J. Hardin (1994) Building the Interspace: Digital Library Infrastructure for a University Engineering Community, *Digital Libraries '94 1st annual conf on Theory & Practice of Digital Libraries*, College Station, TX, Jun, 21-24.
- S. Veretnik and B. Schatz (1993) Pattern Discovery in Gene Regulation: Designing an Analysis Environment, *Proc First Int Conf Intelligent Systems for Molecular Biology*, eds L. Hunter & D. Searls, AAI/MIT Press, Menlo Park, CA, Washington (Jul), 1:411-19 PubMed 7584365.
- B. Schatz (1991) Building an Electronic Scientific Community, *24th Hawaii International Conference on System Sciences*, vol III, Kauai (Jan), 739-748.
- B. Schatz (1989) A Prototype Information Environment, *Proc 2nd IEEE Workshop on Workstation Operating Systems*, Pacific Grove, CA (Sep), 118-124.

- B. Schatz and M. Caplinger (1989) Searching in a Hyperlibrary, *Proc 5th IEEE Int Conf on Data Engineering*, Los Angeles (Feb), 188-197.
- B. Schatz (1987) Telesophy: A System for Manipulating the Knowledge of a Community, *Proc IEEE Globecom '87*, Tokyo (Nov), 1181-1186.
- M. Caplinger and B. Schatz (1987) An information system based on distributed objects, *SIGPLAN Notices* 22 (12): 126-137 (Dec). *Proc ACM OOPSLA Conf*, Portland (Oct), Object-Oriented Programming Systems Languages and Applications.
- B. Schatz (1987) Telesophy, videotape in *Technical Video Stream ACM CHI + GI '87*, Toronto (Apr), 15 min.
- M. Caplinger and B. Schatz (1986) Graphical Database Browsing, *SIGOIS Bulletin* 7(213): 113-121. *Proc ACM Conf on Office Information Systems*, Providence, RI (May).
- B. Schatz (1982) Experience with a UNIX Electronic Mail Service, extended abstract, Bell Labs conf *Workplace in the Information Age*, Murray Hill, NJ (May), 5pp. on PCS.
- B. Schatz (1977) Computation of Immediate Texture Discrimination, *Proc 5th Int Joint Conf on Artificial Intelligence*, Cambridge (Aug), 708.
- B. Schatz (1974) A computer model of photophobia in *Euglena gracilis*, 18pp.  
This paper awarded honorable mention in 1975 ACM Student Paper Competition see *Comm. ACM* 8:494 (Sep 1975).

## Patents

- Expert Consultant in *Kodak v. Sun* patent infringement case, September 2003. settled out of court for \$92M.
- Expert Consultant in *NCR v. Netscape* patent infringement case, May 2000.
- S. Subramaniam, M. Stupar, E. Jakobsson, C. Jamison, J. Fenton, B. Mills, R. Unwin, B. Schatz (1999) *Multiple server repository and multiple server remote application virtual client computer*, **U. S. Patent** 5,859,972 (Jan). assigned to University of Illinois.
- E. Johnson, P. Cochrane, K. Powell, B. Schatz (1997) *System and Method for Interactive Information Retrieval and Management*, **U. S. Patent** pending -- serial 08/957,232.
- K. Wong and B. Schatz (1978) *Method for improving print quality of coarse-scan/fine-print character reproduction*, **U.S. Patent** 4,124,870 (Nov). assigned to IBM.

## INVITED TALKS AND PANELS

See many recent talks with slides and videos at <http://www.beespace.uiuc.edu>

- (2007) Towards Telesophy: Federating All the World's Knowledge, *Google Tech Talk*, July. [www.youtube.com/?v=rxHWE1surzY](http://www.youtube.com/?v=rxHWE1surzY) (Hosted by Vint Cerf)
- (2007) Biomedical Science in the Net of the 21<sup>st</sup> Century: A Tale of Two Systems for Global Infrastructure, School of Information Sciences and Department of Biomedical Informatics, *University of Pittsburgh*, Feb.

- (2006) Viable Health Systems from Distributed Computing Systems, *6<sup>th</sup> Annual Symposium on Understanding Complex Systems*, University of Illinois (May).  
Invited Session Keynote. <http://www.how-why.com/ucs2006/>
- (2005) BeeSpace: An Interactive Environment for Functional Analysis of Social Behavior, *5<sup>th</sup> Annual Symposium on Understanding Complex Systems*, University of Illinois (May).  
Invited Session Keynote. <http://www.how-why.com/ucs2005/>
- (2005) The Evolution of the Net: Predicting Global Infrastructure, *Distinguished Lecture series, Department of Computer Science*, University of Illinois (Feb).
- (2002) The Interspace Beyond the Internet: Networking Infrastructure for Community Knowledge, *The Third Wave of the Internet, CANARIE 8<sup>th</sup> Annual Advanced Networks Workshop*, Montreal Canada (Nov).
- (2002) Concept Switching in the Interspace: Networking Technologies for Community Knowledge, *IEEE International Workshop on Knowledge Media Networking (KMN '02)*, Communications Research Laboratory, Kyoto Japan (Jul). keynote address.
- (2002) The Evolution of the Net: Predicting Network Infrastructure, *Graduate School of Informatics*, Kyoto University, Kyoto Japan (Jun).
- (2002) Why Medicine should be an Information Science, *Clinical Department of Psychiatry*, University of Michigan Medical School, Ann Arbor (Jun).
- (2002) Population Management of Chronic Illness: Towards a Scalable Healthcare Infrastructure, *Comprehensive Depression Center*, University of Michigan Medical School, Ann Arbor (Jan).
- (2001) Concepts across the Interspace: Information Infrastructure for Community Knowledge, *Sheafor-Lindsay Digital Library Symposium*, Rice University, Houston (Dec). [www.citi.rice.edu/dls](http://www.citi.rice.edu/dls)
- (2001) Three Lectures on the Interspace: Functions, Technologies, Applications. *IEEE Kansai Section*, Kyoto University, Japan (Nov). [www.kecl.ntt.co.jp/ieee-kansai/doc/01-9/kouen-schatz.html](http://www.kecl.ntt.co.jp/ieee-kansai/doc/01-9/kouen-schatz.html)
- (2001) Building Analysis Environments: Beyond the Genome and the Web, *Michigan Life Sciences Corridor*, University of Michigan, Ann Arbor (Mar).
- (2000) Digital Libraries for Community Knowledge: The Coming World of the Interspace, *International IEEE Conf on Digital Libraries*, Kyoto University, Japan (Nov).
- (2000) The Net of the 21<sup>st</sup> Century: Concepts Across the Interspace, *CODE (Committee on a Digital Environment)*, Rice University, Houston (Jul).
- (2000) Generic Technologies for Building Analysis Environments, *Language Modeling for BioDiscovery, Bioinformatics Workshop at DARPA FOCUS 2000*, Arlington, VA (Jun).
- (1999) [Towards Informational Science: Indexing and Analyzing the Knowledge of Scientific Communities](#), *The Transformation of Science - Research between Printed Information and the Challenges of Electronic Networks*, **Max Planck Society**, Elmau Castle, Germany (Jun). 1 of 8 foreign speakers at Presidential Level strategy workshop.
- (1999) [The Net of the 21st Century: Concepts across the Interspace](#), *Opening Keynote at CNI (Coalition for Networked Information)*, CNI Spring Meeting, Washington, DC (Apr).
- (1999) [The Golden Age of Scalable Semantics: The Interspace of the 21st Century](#), *Rutgers Symposium on Digital Libraries*, New Brunswick (Mar).

- (1999) [Building Analysis Environments: Beyond the Genome and the Web](#), *University of Michigan Medical School, Bioinformatics Director Lecture*, Ann Arbor (Feb).
- (1998) Towards Scalable Semantics: Concept Switching for Community Repositories, session on Knowledge Mining, *American Society Information Science (ASIS) Annual Meeting*, Pittsburgh (Oct).
- (1998) The Net as the Structure of the World, invited public lecture, Rice University (Mar).
- (1998) [Federating Repositories of Scientific Literature: The Illinois Digital Library Project](#), session on The Digital Libraries Initiative, *AAAS Annual Meeting*, Philadelphia (Feb), abstract.
- (1997) The Interspace of the 21st Century, *ISDL (Int Symposium on Digital Libraries)*, invited foreign speaker, Tsukuba, Japan (Nov), abstract.
- (1997) [Revolutionary Model Systems, The Net, and the Public Interest](#), *NRC/NSF Workshop on Advancing the Public Interest through Knowledge and Distributed Intelligence*, Washington (Sep).
- (1997) The Interspace of the 21st Century, *Cyberfest* library session celebrating Hal's birthday (from 2001: A Space Odyssey), Urbana (Mar).
- (1997) Information Analysis on the Net: The Interspace of the 21st Century, Prospecting for Knowledge session, *AAAS Annual Meeting*, Seattle (Feb), abstract.
- (1997) Collaboration on the Net: The Worm Community System as a Model Community, Electronic Collaboratories session, *AAAS Annual Meeting*, Seattle (Feb), abstract.
- (1996) [The World of a Billion Publishers](#), invited lead lecture at *CSC Index Vanguard* meeting on Implications of Universal Publishing, Pasadena, CA (Nov). (prestigious consulting group for CIOs. advisory board includes Larry Smarr, Alan Kay, Nicholas Negroponte, Bob Lucky)
- (1996) Information Analysis in the Net: The Interspace of the Twenty-First Century, lecture for *National Technological University*, satellite broadcast to industrial partners (Nov).
- (1996) Scalable Semantics for Information Retrieval. lecture at *National Library of Medicine*, Bethesda, MD (Nov). repeated at the *National Cancer Institute*.
- (1995) [Information Analysis in the Net: The Interspace of the Twenty-First Century](#), *Plenary Lecture, American Society Information Science (ASIS) Annual Meeting*, Chicago (Oct). invited keynote speaker.
- (1995) [Building the Interspace: Digital Library Infrastructure for a University Engineering Community](#), SIGLAN session on Overview of the NSF Digital Library Initiative, *American Society Information Science (ASIS) Annual Meeting*, Chicago (Oct).
- (1995) The Worm Community System, SIGSTI session on Scientific Collaboratories: Technological and Sociological Issues, *American Society Information Science (ASIS) Annual Meeting*, Chicago (Oct).
- (1995) The Illinois Digital Library Project, Connecting with Technology symposium, *Lincoln Trails Library System*, Urbana (Sep). plenary speaker.
- (1995) The Illinois Digital Library Project: Towards Search in the Net. *NSF/NCSA WWW Federal Consortium Annual Meeting*, Urbana (Aug).
- (1995) Information Analysis in the Net: The Interspace of the Twenty-First Century. invited speaker in working group on Global Information Infrastructure, *America in the Age of Information: A Forum on Federal Information and Communications R&D*, National

- Library of Medicine (Jul), sponsored by CIC (Committee on Information and Communications, 1 of 9 highest level science policy committees in Federal Government).
- (1995) Invited panel speaker on the Future of Infrastructure for Network Applications and session chair for Information Space Environments, *Internet Society Annual Meeting INET '95*, Honolulu, Hawaii (Jun).
- (1995) Problem Solving in the Net: A&I in the Twenty-First Century, *ACS (American Chemical Society) Chemical Abstracts Services* workshop on The Impact of New Technologies, Columbus, OH (May). invited expert, \$1000 honorarium.
- (1995) Digital Libraries and Infrastructure: Lessons from Traditional Libraries, *IITA Digital Libraries Workshop* (Information Information Technology and Applications; highest level NII technical committee), Falls Church, VA (May). working group chair, co-author of final report on digital library research agenda.
- (1995) The Illinois Digital Library Project, Digital Library Initiative (DLI) project-wide workshop, Urbana (Mar). workshop chair and local arrangements.
- (1995) The Illinois Digital Library Project, Navigating the Internet symposium, *Lincoln Trails Library System*, Champaign (Feb). *keynote speaker*.
- (1995) Building the Interspace: Digital Library Infrastructure for a University Engineering Community, Digital Libraries session, *AAAS Annual Meeting*, Atlanta (Feb).
- (1994) The Worm Community System as a Model for Neuroscience Databases, *Databases for Identifiable Neurons workshop*, *National Science Foundation*, Washington (Jun).
- (1993) Electronic Libraries and Librarians: Who does What in a National Electronic Community, *30th Annual Clinic on Library Applications of Computing*, Urbana (Apr).
- (1993) Mapping Organisms: From a Worm Genome to a Human Brain, *Symposium on Mapping the Human Brain*, *AAAS Annual Meeting*, Boston (Feb), abstract.
- (1992) The Worm Community System: A Model of Electronic Data Sharing in the Biological Sciences, *Human BrainMap Database Workshop*, San Antonio (Dec). see quotes in *Science* 258: 1872-73 (Dec 18) News on Databasing the Brain.
- (1992) Building Analysis Environments, *3rd Keck Symp on Computational Biology*, Houston (Nov). plenary lecture, \$1000 honorarium. abstract in *Cell Motility and the Cytoskeleton* 24: 286 (1993).
- (1992) A Model Electronic Community System, *3rd Keck Symp on Computational Biology*, Houston (Nov), workshop talk.
- (1992) A Model for Integrating Enabling Technologies with Biology, *Satellite Symp on The Human Brain Project*, *Society Neuroscience Meeting*, Anaheim CA (Oct), abstract.
- (1992) The Worm Community System as a Model for Enabling Technologies in Neuroscience, *The Human Brain Project workshop*, *National Institute of Mental Health* (Apr). *keynote speaker*.
- (1992) A Model National Collaboratory System (Informal Community System in Molecular Biology), *CSTB Computer Science and Telecommunications Board study*, *National Collaboratories: Applying Information Technology for Scientific Research*, National Academy of Science (Washington - Mar, Irvine CA - Apr).
- (1992) A Digital Library for a Biology Community: An Operational Prototype, *AAAS Annual Meeting*, Chicago (Feb), abstract.

- (1991) Supporting Community Knowledge, *Genome Sequencing Conference III*, Hilton Head SC (Sep), abstract.
- (1990) The Worm Community System, *Task Force on National Brain Mapping Databases*, Institute of Medicine, National Academy of Science, Washington (Jan).
- (1989) Towards the Electronic Library: Managing Large Hypertext Collections, *American Society Information Science (ASIS) Annual Meeting*, Washington (Oct), abstract.
- (1989) Telesophy: Towards World-wide Information Spaces, *UCLA ACT ONE: Symposium on Very High Speed Information Networks*, Los Angeles (Aug). (20th Anniversary Celebration for the ARPANET)
- (1984) Telesophy: a WorldNet Browser, *Office of the Future Revisited auditorium series*, Xerox PARC, Palo Alto (Dec), 75 min videotape. \$1000 honorarium.

### Book and Report Chapters

- B. Schatz (2003) invited foreword to N. van House, B. Buttenfield, A. Bishop (eds), **Digital Library Use: Social Practice in Design and Evaluation**, MIT Press.
- H. Chen and B. Schatz (2001) A Path to Concept-based Information Access: From National Collaboratories to Digital Libraries, G. Olson, T. Malone, J. Smith, (eds), **Coordination Theory and Collaboration Technology**, Lawrence Erlbaum Associates. Written 1996.
- B. Schatz (2000) book review of J. S. Brown and P. Duguid, **The Social Life of Information**, Science, invited essay entitled “*Learning by Text or Context*”, **Science** 290: 1304 (17 Nov 2000).
- B. Zhu, M. Ramsey, D. Ng, H. Chen, and B. Schatz (1999) Creating a Large-Scale Digital Library for Georeferenced Information, **D-Lib Magazine: The Magazine of Digital Library Research**, Jul, [www.dlib.org](http://www.dlib.org) .
- B. Schatz (1998) Information Analysis in the Net: The Interspace of the 21st Century, **Proc 1997 (34th) Annual Clinic on Library Applications of Data Processing**, P. Cochrane and E. Johnson (eds), Graduate School of Library & Information Science, University of Illinois, pp110-126. reprint of 1995 ASIS Plenary Lecture (invited keynote).
- S. Harum, W. Mischo, and B. Schatz (1996) [Federating Repositories of Scientific Literature: The Illinois DLI Testbed](#), **D-LIB Magazine: The Magazine of Digital Library Research**, special issue on DLI Testbeds, Jul. [www.dlib.org](http://www.dlib.org)
- D. Mount and B. Schatz (1994), A Genomic Database for E. coli : Total Information on a Given Organism, in **Biocomputing: Informatics and Genome Projects**, D. Smith (ed), Academic Press, pp249-267.
- National Research Council (1993) committee member of CSTB Computer Science and Telecommunications Board study, **National Collaboratories: Applying Information Technology for Scientific Research**, National Academy Press, Mar 1993, 105pp. (study 1991-93) authored chapter on Building Collaboratories in Molecular Biology.
- B. Schatz (1993) Building an Electronic Community System, reprinted in R. Baecker (ed), **Readings in Groupware and Computer Supported Cooperative Work** (Morgan Kaufmann, 1993), pp 550-560 in Chapter 9 on Cooperative Hypertext and Organizational Memory.

- B. Schatz (1993) Electronic Libraries and Librarians: Who Does What in a National Electronic Community, in *Emerging Communities: Integrating Networked Information into Library Services*, **Proc 30th Annual Clinic on Library Applications of Data Processing**, A. Bishop (ed), Graduate School of Library & Information Science, University of Illinois, pp264-274.
- B. Schatz (1987) Building a Matrix Computer System, in **Report of the Matrix of Biological Knowledge Workshop**, H. Morowitz & T. Smith (eds), Santa Fe Institute (Oct), 4pp.
- K. Wong and B. Schatz (1983) Algorithms for image enhancement of coarsely scanned text data, **Graphical and Binary Image Processing and Applications**, J. Stoffel (ed), ARTECH House, pp477-91. Reprint of 1975 IBM Research Report RJ 1682.

### **Abstracts (Conferences, Workshops, Newsletters)**

- B. Schatz, G. Robinson, C. Zhai (2004) Functional Analysis from Biomedical Literature, Int. Gene Ontology Workshop, Chicago, Oct.
- B. Schatz (2001) Indexing Technologies for Public Participation in Digital Cities, 2<sup>nd</sup> Kyoto Meeting on Digital Cities, Kyoto Japan, Oct.
- <my lab> D. Dubin and D. Pape (1999) Validation Strategies for Large-Scale Clustering Applications, CSNA '99 (Classification Society North America) Conf, Pittsburgh, Jun.
- C. Jamison, B. Mills, and B. Schatz (1995) WCS in Mosaic: The ENQUIRE System, 10th Int C. elegans Conf, Madison, WI, Jun, 1pp.
- B. Schatz, E. Grossman, T. Friedman, K. Powell, J. Calley, H. Chen, L. Star, S. Hudson, and S. Ward (1993) The Worm Community System, release 2, 9th Int C. elegans Conf, Madison, WI, Jun, 1pp, platform talk.
- J. Calley, G. Myers, S. Ward, and B. Schatz (1992) A Lineage Analysis Tool for the Worm Community System, West Coast Worm Meeting, Berkeley, Jun, 1pp.
- B. Schatz, T. Friedman, E. Grossman, K. Powell, J. Calley, S. Hudson, S. Ward (1992) The Next Release of the Worm Community System (WCS), Midwest Worm Meeting, St. Louis, Jun, 1pp, platform talk.
- B. Schatz, T. Friedman, E. Grossman, K. Powell, A. Yeatts, L. Peterson, S. Hudson, S. Ward (1992) Availability of WCS (Worm Community System), Release 1, The Worm Breeders Gazette, vol 12, no 2, Jan, page 12.
- K. Powell and B. Schatz (1992) The Electronic Gazette, The Worm Breeders Gazette, vol 12, no 2, Jan, page 11.
- B. Schatz (1991) The Worm Community System: A Large-Scale Distributed Object Space, demonstration at OOPSLA 91 (Object-Oriented ...Applications), Phoenix, Oct, 1pp.
- B. Schatz, S. Hudson, L. Peterson, and S. Ward (1991) Building a National Collaboratory Testbed, NSF Workshop on Coordination Theory and Collaboration Technology, Washington, DC (Jun), pp 99-105.
- B. Schatz, S. Ward, A. Yeatts, K. Powell, S. Hudson, and L. Peterson (1991) The Worm Community System, 8th Int C. elegans Conf, Madison, WI (Jun), 1pp, platform talk.

- B. Schatz (1991) Organizational Memory, Winter Symp Future Directions Collaboration Technology, Tucson, AZ (Mar), 2 pp.
- B. Schatz, S. Ward, S. Hudson, and L. Peterson (1990) The Worm Community System, The Worm Breeders Gazette, vol 11, no 4, Sept, page 6.
- B. Schatz (1989) Telesophy: System Support for the Abstract Model of an Information Space, 3rd Int Conf on Human-Computer Interaction, Boston (Sep), 2pp.
- B. Schatz and S. Ward (1989) A computer system for supporting an electronic scientific community, Macromolecules, Genes, and Computers II, New Hampshire (Aug), 1pp.
- B. Schatz (1989) Towards Metropolitan-Area Community Libraries, 3rd IEEE Workshop on Metropolitan Area Networks, San Diego (Mar), 2pp.
- B. Schatz (1988) The Telesophy Prototype: A Large-Scale Hyperlibrary System, Proc AAAI Workshop on AI and Hypertext, St. Paul (Aug), 3pp.
- B. Schatz (1987) Building the Global Information Community, 10th Data Communications Symposium: Building the Global Network, Napa Valley, CA (Oct), 2pp.
- B. Schatz (1982) Experience with a UNIX Electronic Mail Service, extended abstract, Bell Labs conf Workplace in the Information Age , Murray Hill, NJ (May), 5pp.

## Technical Reports

- B. Schatz (1990) **Interactive Retrieval in Information Spaces Distributed across a Wide-Area Network**, University of Arizona Computer Science Dept, Tech Report 90-35 (Dec), 95pp. PhD Dissertation.
- B. Schatz and T. Judd (1989) Customized Electronic Magazines, Bellcore Technical Memo, TM-ARH-013-665 (Feb), 9pp.
- B. Schatz (1988) Technology Transfer Package: Telesophy Prototype, Bellcore Technical Memo, TM-ARH-012-156 (Jul), 14pp.
- B. Schatz (1986) Telesophy: A System for Browsing and Sharing inside a Large Information Space, Bellcore Technical Memo, TM-ARH-006094 (Aug), 12pp.
- B. Schatz (1985) Telesophy, Bellcore Technical Memo, TM-ARH-002487 (Aug), 76pp.
- B. Schatz and R. Kline (1984) The Single Computer Model: Philosophy and Feasibility, Bellcore Technical Memo, TM-21440-84-01 (Apr), 26pp.
- B. Schatz and C. Strada (1982) Personal Communication System (PCS) Primer, Bell Labs Memo for File, Case 40468-005 (Oct), 46pp. Revision of: B. Schatz and T. Kennedy, PCS Primer, Bell Labs Memo for File, Case 40468-5 (Mar 1981), 43pp.
- B. Schatz (1981) Company-Wide Electronic Mail, Bell Labs Engineer's Notes (Dec), 8pp.
- C. Hayden, B. Schatz, and J. Smith (1981) CS600 Information Processing Resources Architecture, Bell Labs Memo for File, Case 40468-003 (Dec), 52pp.
- B. Schatz (1981) A Strategy for Data Services in CS600, Bell Labs Memo for File, Case 40468-004 (Apr), 22pp.
- B. Schatz, R. Cattell, S. Hobbs, B. Leverett, J. Newcomer, A. Reiner, and W. Wulf (1979) TCOL-Ada: An intermediate representation for the DOD standard programming language, CMU Computer Science Dept, Tech Report 79-112 (Mar), 26pp.

- B. Leverett, R. Cattell, S. Hobbs, J. Newcomer, A. Reiner, B. Schatz, and W. Wulf (1979)  
An Overview of the Production-Quality Compiler Project, CMU Computer Science Dept,  
Tech Report 79-105 (Feb), 60pp.
- B. Schatz (1978) Computation of Immediate Texture Discrimination, CMU Computer  
Science Dept, Tech Report 78-152 (Dec), 22pp.
- B. Schatz (1977) Computation of Immediate Texture Discrimination, MIT Artificial  
Intelligence Lab, Memo 426 (Aug), 97pp. M.S. thesis, also NTIS AD-A053-804.
- B. Schatz (1976) Algorithms for optimizing transformations in a general purpose compiler,  
IBM Research Centers, Report RC 6232 (Oct), 11pp.
- B. Schatz (1976) On the use and representation of semantic categories, MIT Artificial  
Intelligence Lab, Working Paper 128 (Nov), 11pp.

### **Colloquium Talks**

#### *Auditorium Talks*

- University of Illinois (Beckman Institute) (1989)
- NEC Central Research Labs (Japan) (1987)
- Xerox PARC (1984)

#### *Seminar Talks*

- University of Illinois (1992), University of Michigan (1992,2000,2001,2002)
- University of Pittsburgh (2007)
- Harvard University (2006), Indiana University (2006),
- University of Georgia (2006), Iowa State University (2006)
- University of California at San Diego (2001), University of Maryland (2001)
- University of Washington (1998), Pennsylvania State University (1999)
- Massachusetts Institute of Technology (1985), Carnegie-Mellon University (1985,1998)
- University of Arizona (1988,89,1990,91,92), Rice University (1998,2000,2001)
- Tsukuba University (Japan) (1985,2002)
- Kyoto University (Japan) (2000,2001,2002,2003,2004)

- National Institutes of Health, National Institute for General Medical Sciences (2006)
- National Library of Medicine (1987,89,96,97), Los Alamos National Laboratory (1988)
- National Cancer Institute - National Institutes of Health (1996,96,97,98), Biosis (1997)
- Washington University Medical School (1991,98), Johns Hopkins Medical School  
(1991,92) Smith-Kline Beechman Research Laboratories (1997,98)
- National Academy of Sciences (1990,91,92,94,96,97,97,98,99,00)
- National Science Foundation (1991)

- Microelectronics Computer Corporation (MCC) (1987), Apple Computer (1987,88)
- Bell Communications Research (1985, 86, 87, 88), Bell Laboratories (1980, 81)

#### *Advanced Study Institutes*

- Workshop on the Matrix of Biological Knowledge, Santa Fe Institute, NM, Jul-Aug 1987
- NATO Advanced Study Institute on Artificial Intelligence, Santa Cruz, CA, Jul 1976

## TEACHING

Interim Director writing campus-wide PhD degree program in Biomedical Informatics, as part of I3 (Illinois Informatics Initiative)

Chair, Bioinformatics MS Degree committee GSLIS and primary author of Option proposal for campus-wide MS degree in Bioinformatics, approved as new Option in Spring 2004. (first new MS degree ever in GSLIS, separate from standard LIS MS)

Developed a course entitled Architecture of Network Information Systems formally approved as LIS 430 and CS 413 (first joint course between these departments) project-based design course for information systems and digital libraries taught this for 4 years to enthusiastic groups of LIS and CS graduate students, 1994-1997. taught again to interdisciplinary group of students as graduate seminar, Spring 2005.

Taught Doctoral Seminar in GSLIS on Technologies for Digital Libraries, Fall 1998.  
Taught MS GSLIS 450 Digital Libraries as first wave of large technology courses intended for general Master's students. Developed course from scratch for Spring 2003.  
Taught LIS 450DL Digital Libraries, Spring 2002 and 2003.  
Developed supercore course on Building Digital Libraries, approved 2004 as LIS 509.

Taught Doctoral Seminar in GSLIS on Medical Informatics and Healthcare Infrastructure, Fall 2000 (joint listed in Computer Science and in Medicine).  
Taught MS GSLIS 450MIH Medical Informatics and Healthcare Infrastructure, Spring 2004.  
Developed MS course on Health Informatics for Bioinformatics MS Option.  
Taught as LIS 490HI Healthcare Infrastructure, Fall 2005.  
Taught as CS598HI/LIS590HI Healthcare Infrastructure, Fall 2007.

Taught Doctoral Seminar in GSLIS on Federating Community Collections, Fall 2003.  
Co-taught Research Seminars in Computer Science on Technologies of Scalable Semantics, Fall-Spring 1997-1998.

Taught MS GSLIS 317 Data Processing for Library & Information Science, Fall 1999.  
Taught MS GSLIS 329 Information Retrieval and Storage (introductory technology course).  
3 times: Spring 2001, Fall 2003, Fall 2004.  
Distance education section taught to students nationwide over the Internet (LEEP).  
Taught MS GSLIS 429 Implementation of Information Retrieval, Spring 2004.

Taught undergraduate course on The Evolution of the Net: Network Infrastructure from the Telephone Network to the Global Mind. Based on in-progress book with same title.

Supervised 58 different independent studies for GSLIS and for CS students.

Taught parts of courses in Management Information Systems, Molecular & Cellular Biology, Computer Science at University of Arizona; my research information system used as supplementary material in several biology graduate and undergraduate courses.

### **Students Supervised at University of Arizona**

*Sean Drew*, MS in Management Information Systems, 1992-93. (to Motorola)  
thesis on transporting WCS front end to MS Windows environment.

*Kevin Powell*, BS in Molecular & Cellular Biology, 1991-93. (to UIUC)  
project on electronic encoding/display of biological literature.

*Stella Veretnik*, Postdoc in computational biology, 1992-93. (to UCSD)  
analysis environments for patterns in gene regulation.

Awarded NSF postdoc fellowship (grant to Schatz as supervisor)  
CISE Postdoctoral Research Associates in Experimental Science.

*John Calley*, PhD student in Molecular & Cellular Biology (to Lilly Pharmaceutical).  
project on tree manipulation algorithms for cellular development.

participant in training grants in biology at University of Arizona:

investigator in *NSF Research Training Group: Analysis of Biological Diversification*  
awarded \$1.5M for 5 years from NSF DIR-BIO.

investigator in Flinn Foundation *Interdisciplinary Training in Genetics*  
awarded \$500K for 5 years.

### **Students Supervised at University of Illinois**

*Brant Chee*, MS in Library & Information Science, 2005 (Dec) (to UIUC BeeSpace)  
Thesis on *Semantic Document Clustering using Small Worlds Community Algorithms*.

*Barry Sanders*, MS in Library & Information Science, 2004 (Dec) (to NCSA)  
Project on *Internet Health Monitors for Tracking Chronic Illness*.

*Conrad Chang*, PhD in Computer Science, 1998-2002 (May) (to Mitre Corporation)  
Dissertation on *Adaptive Multi-granularity Locking Protocols in Object-Oriented Databases*.

On thesis committee and supervised in CANIS laboratory his research on distributed databases for information retrieval.

*Qin He*, PhD in Library & Information Science, 1998-2000 (May) (to Rutgers University)  
Dissertation on *Component Study of Co-Word Analysis*.

On thesis committee and supervised in CANIS laboratory her research on clustering using statistical parsing for information retrieval.

*Bill Pottenger*, PhD in Computer Science, 1995-1997 (May) (to Lehigh University)  
Dissertation on *Theory, Techniques, and Experiments in Solving Recurrences in Computer Programs*. On thesis committee and supervised in CANIS Laboratory his research on parallel optimization of numerical codes for information retrieval.

*Nuala Bennett*, Postdoc in computational linguistics, 1996-1998 (to UIUC Library).  
linguistic analysis and preprocessing for concept spaces.

*Curt Jamison*, Postdoc in computational biology, 1994-1996. (to National Agriculture Library) cellular databases for gene expressions (lineage and anatomy displays).  
Awarded NSF postdoc fellowship (grant to Schatz as supervisor)  
CISE Postdoctoral Research Associates in Experimental Science.

*Dan Pape*, MS in Library & Information Science, 1998-2000. (to Silicon Valley startup)  
project on information spaceflight over document landscapes.

*Alan Braverman*, BS in Computer Science, 1995-1996. (to Silicon Graphics)  
project on semantic indexing in concept spaces.

*Sarim Siddiqui*, MS in Computer Science, 1995-1996. (to Oracle Computer)  
project on object-oriented database retrieval for concept spaces.

*Lifang Yao*, MS in Library & Information Science, 1994-1995. (to Oracle Computer)  
project on classification techniques in Web search engines.

*Brad Mills*, MS in Computer Science, 1994-1995. (to Lilly Pharmaceutical)  
project on federated network gateways to online biology databases.

*Laura Shoman*, MS in Library & Information Science, 1993-94. (to Chicago Library)  
project on user coordination for an electronic community system (WCS).

### **Current PhD students in CANIS Laboratory**

*Kevin Powell*, Library & Information Science (supervisor) (to Microsoft Research)  
Dissertation on *Community-Based Infrastructure for Collaborative Information Retrieval*.  
PhD expected December 2005.  
supervised his research for 9 years from undergraduate days to project lead.

*Brant Chee*, Library & Information Science (supervisor)  
Dissertation on *Document Clustering using Small Worlds Communities*.  
PhD expected December 2009.

On Committee of other PhD students in Library & Information Science:

*Xiao Hu* (member), *Chulin Meng* (member),  
*Joonhong Lee* (member), *Larry Jackson* (member)

On Committee of other PhD students in Computer Science:

*Xu Ling* (co-supervisor), *Xin He* (co-supervisor)  
*Jing Jiang* (member), *Qioazhu Mei* (member),  
*Dong Xin* (member), *Azadeh Shakery* (member)

## **Faculty in my Laboratory**

*S. Leigh Star*, training fellowship from NSF SBE on ecology of infrastructure, 1995-96.  
*Duncan Lawrie*, sabbatical from UIUC Department of Computer Science after serving as chairman, 1996-97, to study custom hardware for semantic information retrieval.  
*Fabio Piccolini*, sabbatical from Italian National GIS Laboratory, 1997-98.

## **Research Programmers from My Laboratory**

Michael Caplinger, Bellcore (to NASA Mars robotics, Caltech)  
Stephen Bullick, Bellcore (to US West Research Labs, Boulder)  
Edward Grossman, Arizona (to IBM R&D Labs, Austin)  
Theron Friedman, Arizona (to University of Arizona Library, Tucson)  
Charles Herring, Illinois (to Australian National Defense Research Center, Melbourne)  
Jason Ng, Illinois (to Silicon Valley startup)  
Baba Buehler (to Austin Texas startup)  
Sean O'Casey (to Microsoft, Seattle)  
Bob Sandusky (to Chicago MIS consulting firm)  
Yi-ming Chung (to Wall Street consulting firm then to Sun Microsystems)  
Eric Johnson (to Washington DC consulting firm then AOL Phoenix)  
Ben Gross (to Silicon Valley venture capitalist)  
Dan Pape (to Silicon Valley startup)  
Qin He (to Seibel E-commerce, Silicon Valley)  
Les Tyrrell (to Washington State agriculture robotics firm)  
Kevin Powell (to Microsoft Research, Seattle)  
Conrad Chang (to Mitre research center, Boston)

## **Continuing Education**

Taught Tutorials on Digital Libraries at NCSA Alliance 98 meeting and at UIUC functions (7 times 1994-1997).  
continuing education for Engineering College at University of Illinois: lectures for satellite broadcast in 1996-97 on Future of the Net.  
taught courses in Engineering Information Systems at Bellcore and in Communications Network Architecture at Bell Labs; supervised numerous postdoctoral fellows and graduate students for summer positions.

## University Service

Wrote Strategic Plan for Department of Medical Information Science, College of Medicine, and Plans for bioinformatics at Institute for Genomic Biology and for health informatics at Institute for Advanced Computing Technology and Applications, 2004-2006.

Campus Bioinformatics Steering Committee, GSLIS representative, 2005-2007

Invited advisor, CCC Campus Computing and Networking Committee, report to the Chancellor on Information Resources for the 21st Century, 1995.

Adhoc committee on Technology courses, GSLIS, 1995-96.

Obtained grant and purchased equipment for computer lab for GSLIS, 1995,2000.

Advanced studies committee, admissions committee GSLIS, University of Illinois.

Member, Biotechnology Computing committee, University of Arizona, 1991-1993.

Faculty search committee for computational biology, Dept of Molecular & Cellular Biology.

Chair, external advisory panel on Developing Information Sciences at University of California at Santa Barbara (starting a new School), Dec 1996 - Feb 1997.  
author of report recommending establishment of a new school.

## Editorships of Journals or Program Committee for Conferences

co-editor, special issue of **IEEE Computer** on *Digital Libraries: Technological Advancements and Social Impacts* , Feb 1999.

co-editor, special issue of **IEEE Computer** on *Large-Scale Digital Libraries*, May 1996, collected articles and wrote introductions.

Program Committee, *4th Int ACM Conference on Digital Libraries*, 1999.

Program Committee, *3rd Int ACM Conference on Digital Libraries*, 1998.

Program Committee, *1st Int ACM Conference on Digital Libraries*, 1996.

Program Committee, *Internet Society annual meeting*, 1995.

## Reviewing and Refereeing

*National Science Foundation (NSF)*

Information Technology Research (ITR) review panels

in Information Systems and in Biological Infrastructure

Directorate of Computer & Information Science & Engineering (CISE)

Division of Information & Intelligent Systems (IIS)

Division of Communications & Network Research (CNR)

Directorate of Biological Sciences (BIO)

Division of Biological Infrastructure (DBI)

Division of Neuroscience (NRS)

Frontiers Integrative Biological Research (FIBR) review panels

*National Research Council (NRC)*

Computer Science and Telecommunications Board (CSTB)  
Biological Sciences Board (BSB)  
Special Projects Board (SPB)

*Journal Refereeing:*

AAAS Science magazine  
IEEE Computer magazine  
IEEE Communications magazine  
IEEE Trans Knowledge & Data Engineering (KDE)  
ACM Trans Information Systems (TOIS)  
ACM Trans Programming Languages & Systems (TOPLAS)  
International Journal of Digital Libraries  
Journal American Society Information Science (JASIS)  
Computer Graphics & Image Processing

*Conference Refereeing:*

ACM Int Conf Digital Libraries (SIGIR,SIGLINK)  
ACM Int Conf Information Retrieval (SIGIR)  
American Society Information Science Conf (ASIS)  
IEEE Int Conf Data Engineering (Data Engineering)  
ACM Symp Management of Data (SIGMOD)  
ACM Symp Communication Architectures (SIGCOMM)  
IEEE Global Communications Conf (Globecom)  
ACM Conf Computer Human Interaction (SIGCHI)  
ACM Symp User Interface Software Technology (UIST)  
International Joint Conference on Artificial Intelligence (IJCAI)  
ACM Symp Principles Programming Languages (SIGPLAN)  
ACM Symp Compiler Construction (SIGPLAN)

**Activities in Professional Societies**

fellow of: AAAS (American Association for Advancement of Science)  
former member of: ACM (Association Computing Machinery), IEEE (Institute of Electrical and Electronics Engineers), ASIS (American Society for Information Science), AMIA (American Medical Informatics Association), Internet Society

**Personal Data**

U.S. Citizen born March 7, 1954  
Married (to Japanese citizen), one child (daughter attending University High School)