SHANNON BRADSHAW, Ph.D.

sbradsha@drew.edu

Summary of Qualifications

- 14 years of R&D in information management, interaction design, and search.
- 12 years of teaching experience in computer science, IT, and management.
- 8 years of IT consulting/development experience in search and information management.
- 6 years of IT project management experience.
- Professional presentation and outstanding communication skills.
- A well-developed ability to assess and meet the needs of customers.

Education

Ph.D.   *Computer Science*, Northwestern University, 2002

M.S.   *Computer Science*, The University of Chicago, 1998

B.S.   *Computer Science*, Olivet Nazarene University, 1994

Experience

Director of the Computer Science Program & Associate Professor of Computer Science,
Drew University, Madison, NJ (June 2006 - Present)

At Drew, I direct the Computer Science program, teach, and explore research in the areas of **search**, **information management**, and **computer science education**. Since arriving at Drew in June 2006, I have overseen a comprehensive **revision** of the computer science **curriculum**. A key feature of the new curriculum is **engaged learning**. Students in upper-level courses learn core computer science topics in the context of projects for real customers. I also oversee **outreach** and **marketing** of the program. To date, we have established collaborations with several **corporate partners**, the Drew University Library, and two academic departments (Economics and English). We draw course projects from such partnerships.

Consultant, Morgan Stanley, New York, NY (September 2009 - January 2010)

At Morgan Stanley I designed **authoring tools** and an **indexing and retrieval system** for managing firm-wide policy documents. The authoring tools include **integration with Microsoft Word** and a web-based authoring solution. In addition to typical authoring tasks, this framework enables authors to **annotate (tag) content** to the sentence level with identifiers from a variety of topic maps. The indexing and retrieval system is fully configurable using a set of **XML schemas** that easily accomodate new document types (e.g. procedures) and the addition of new **topic mapping** as needed. This system is now in development.

Consultant, Fairfield Advisors, LLC., Madison, NJ (December 2006 - August 2009)

Fairfield Advisors is a small **hedge fund**. Working with many **Drew students**, at Fairfield I have developed a number of **automated trading**, **data services**, and **accounting applications** on a wide range of platforms.

Principal, Jamseed, Inc. New York, NY (February 2008 - August 2009)

Jamseed is an Internet startup company that enables musicians and other artists to connect with there fans through a range of personalized services and products.

Instructor, Goldman Sachs New Analyst Training Program, New York, NY (July 2007 - September 2007, August 2009)

At Goldman Sachs I trained newly hired software engineers in courses on the programming languages **C++, Java 1.5, and JavaScript** and various related topics including **design patterns, the Java Collections Framework, JDBC, JUnit, DOM, XML, and AJAX**. These courses provided detailed coverage of each topic and required students to complete substantial software development projects.

Instructor, The New Jersey Governor's School in the Sciences, Madison, NJ (Summer 2006, Summer 2007)

The Governor's School in the Sciences is a program for top high school students in New Jersey entering their senior year. Nearly all graduates of the program go on to Ivy League universities. Students take courses and work on research projects with college faculty and professionals from around the state. In this program, I taught courses in the areas of **human-computer interaction** and **information retrieval**.

Consultant, Anton McCaffrey Laboratory, Department of Internal Medicine,
The University of Iowa (August 2006 - October 2006)

As a consultant to the McCaffrey Laboratory, I developed software tools written in **Perl** for **analyzing DNA sequences** to locate binding sites for proteins of interest in wet lab work. We have submitted an abstract of this work to the 11th Annual Meeting of the American Society of Gene Therapy and hope to publish an article in late 2008 or early 2009.

Assistant Professor, Tippie College of Business & Assistant Professor of Computer Science,
The University of Iowa (July 2002 - June 2006)

At Iowa I **managed eight people** in developing Beedance, an **information and knowledge management** system for **biomedical** and **pharmaceutical** research as well as other fields of study. Our objective with Beedance was to reduce the degree to which different researchers duplicate the same literature search efforts as others. In addition to **vision casting** I contributed to the following aspects of this project:

- Design of the **system architecture**.
- Design of the **user interface**.
- Design of the **information repository**.

- Design and implementation of a client application that integrates reading, browsing, organization, and **annotation functionality** (i.e. highlighting, margin notes, etc.) (**Java**).
- Design and implementation of **indexing and retrieval algorithms** (**Java**).
- Design and implementation of **citation index** (**Perl**).

Consultant, Dizpersion, Inc., Evanston, IL (March 2002 - July 2002)

At Dizpersion I consulted on the system design and development of the core technology on which the company is founded. During the short period of time I consulted to Dizpersion, we **designed**, **built**, and **launched** the Running Ten system. Running Ten maps IP addresses to geographic location (i.e. zip code) and demographic information to enable **targeted marketing** on web sites with a broad user base. See http://www.dizpersion.com. I left Dizpersion to take a faculty position at the University of Iowa.

Consultant, GartonWorks, Inc., Madison, WI (July 1999 - December 2001)

During over two years with GartonWorks, I served as a business analyst, functional analyst, and senior software engineer on the InSite project. InSite is a real-time **meta-search** and **information management** system for law enforcement agencies. My contributions to this project were in the following areas:

- **Assessment of client needs** (through interviews with law enforcement officers).
- Design of the **InSite system architecture** and **data language**.
- Design of the InSite **user interface**.
- Implementation of wrappers for **legacy databases, Oracle systems, and web-based information sources** (**Java**).
- Design and implementation of the **information aggregation system** for merging search results from dozens of information sources into any of several formats (**Java**).

Research Assistant, Northwestern University, Evanston, IL (January 1999 - August 2002)

My primary focus at Northwestern was to develop a **new type of search engine** which extends the **Google PageRank** idea to incorporate not just the number of links to a document, but the reason for these links as well. My approach, called Reference Directed Indexing (RDI), employs the contexts of citation to a document as a basis for indexing. Contexts of citation or citation sentences as they are also called, consist of a block of text surrounding the point of reference to a document within the body of another document. As a retrieval metric, RDI prefers documents that have been frequently cited using the terms in a query. I developed my search engine using the **C++** and **Perl** languages. As part of this project I built the following software systems:

- Several **topic-specific web crawlers** (**Perl**).
- An **indexing and retrieval system** for HTML and PDF documents (**Perl/C++**).
- A **citation index** based on citation sentences (**Perl**).
- A **document parsing library** for extracting title, authors, bibliography entries, etc. (**Perl**).

Research Assistant, The University of Chicago (September 1995 - December 1998)

At the University of Chicago I worked with a team of five in research, design, and development of a $1M project funded by **McKinsey & Company**. This project resulted in the creation of the SingleSource system. SingleSource is a **meta-search** and **information management** system targeted at addressing the information needs of consultants in the field. We developed two pieces of technology: 1) a system to integrate search of all databases and other electronic corporate resources in a single interface and 2) a system to capture and index all requests from consultants and the information they found. When a new request was found to match a prior request, SingleSource informed the consultant automatically. My contributions to this project were as follows:

- **Assessment of client needs** (through interviews with McKinsey employees).
- Implementation of an **information brokering system** for gathering and distributing information from web resources (**Java**).

Research Assistant, Argonne National Laboratory, Lemont, IL (January 1994 - April 1996)

While at Argonne I worked on a number of projects in the Mathematics and Computer Science Division and in the Decision and Information Sciences Division. These projects were mostly **data visualization** applications ranging from **computational biology** to **climate modeling** (**C++/Java**).

Research Interests

I am interested in human interaction with electronic documents and leveraging such interaction to automatically manage information of interest across on-line communities. Currently, I am exploring metrics to **aggregate the annotations** (highlighted passages, margin notes, etc.) of many readers of the same document as a means of pointing later readers to the valuable information a document contains. We have published three papers on this work to date. In addition, we have completed a beta version of a pdf viewer and document organization system called **Beedance**. Beedance enables researchers to annotate PDF articles and **share their annotations** with a research community. In other work, I have developed and implemented a novel approach to indexing and retrieval in search engines for scientific literature. This approach models a document not based on the words used within the document, but instead by the words authors use in reference to that document (sometimes called **citation sentences** or contexts of citation). I have also published work exploring shared annotation and **match-making for collaboration** and discussion around web sites.

Publications

Peer Reviewed

S. Bradshaw and M. Light. Annotation Consensus: Implications for Passage Recommendation in Scientific Literature. In Proceedings of the Eighteenth ACM Conference on Hypertext and Hypermedia. Manchester, UK, September 10-12, 2007. (Acceptance ratio 29%)

S. Bradshaw, M. Light, and D. Eichmann. (Bee)Dancing on the Boundary Between PIM and GIM. SIGIR Two-Day Workshop on Personal Information Management. 2006

H. Wang, **S. Bradshaw**, M. Light. Automatic Highlighting of Bioscience Literature. ACL/ISMB Joint Workshop on Linking Biological Literature, Ontologies and Databases: Mining Biological Semantics. 2005.

A. Shamma, S. Owsley, **S. Bradshaw**, K. Hammond. Using Web Frequency Within Multimedia Exhibits. In Proceedings of ACM Multimedia 2004, New York, NY, October 10-16, 2004. (Short paper acceptance ratio 29%)

S. Owsley, A. Shamma, **S. Bradshaw**, K. Hammond, S. Sood. The Association Engine: A Free-Associative Digital Improvisor. In Proceedings of ACM Multimedia 2004, New York, NY, October 10-16, 2004.

A. Shamma, S. Owsley, K. Hammond, **S. Bradshaw**, J. Budzik. Network Arts: Exposing Cultural Reality. In Proceedings of WWW 2004 Alternative Track, New York, NY, May 17-22, 2004. FINALIST FOR BEST PAPER. (Acceptance ratio 23/86 (27%))

S. Bradshaw Reference Directed Indexing: Redeeming Relevance for Subject Search in Citation Indexes. In Proceedings of the 7th European Conference on Research and Advanced Technology for Digital Libraries, 2003. (Acceptance ratio 47/161 (29%))

Gautam Pant, **S. Bradshaw**, Filippo Menczer. Search Engine-Crawler Symbiosis: Adapting to Community Interests, In Proceedings of the 7th European Conference on Research and Advanced Technology for Digital Libraries, 2003. (Acceptance ratio 47/161 (29%))

J. Budzik, **S. Bradshaw**, X. Fu, K. Hammond. Clustering for Opportunistic Communication. In Proceedings of WWW 2002, Honolulu, HI, May 7-11, 2002. (Acceptance ratio 72/454 (16%))

J. Budzik, **S. Bradshaw**, X. Fu, K. Hammond. Supporting Online Resource Discovery in the Context of Ongoing Tasks with Proactive Assistants. International Journal of Human-Computer Studies: Special Issue on Awareness and the WWW. Academic Press. 2002. (ISI impact factor 0.74)

S. Bradshaw, K. Hammond. Using Citations to Facilitate Precise Indexing and Automatic Index Creation in Collections of Research Papers. Knowledge-Based Systems. Elsevier. 14(1-2), pp 29-35. 2001. (ISI impact factor 0.83)

D. Wilson, **S. Bradshaw**. CBR Textuality. Expert Update, 3(1), 28-37. 2000.

S. Bradshaw, K. Hammond. Guiding People to Information: Providing an Interface to a Digital Library Using Reference as a Basis for Indexing. In Proceedings of Intelligent User Interfaces 2000. New Orleans, LA, January 9-11, 2000. FINALIST FOR BEST PAPER. (Acceptance ratio 30%)

D. Franklin, **S. Bradshaw**, K. Hammond. Jabberwocky: You Don't Have to Be a Rocket Scientist to Change Slides for a Hydrogen Combustion Lecture. In Proceedings of Intelligent User Interfaces 2000. New Orleans, LA, January 9-11, 2000. (Acceptance ratio 30%)

S. Bradshaw, K. Hammond. Constructing Indices from Citations in Collections of Research Papers. In Proceedings of the Sixty-Second Annual Meeting of the American Society for Information Science, Washington, D.C., October 31 - November 4, 1999.

S. Bradshaw, T. Canfield, J. Kokinis, T. Disz. An Interactive Virtual Environment for Finite Element Analysis. In Proceedings of High Performance Computing 1995, Phoenix, AZ, April 9-13, 1995.

J. Rowlan, G. E. Lent, N. Gokhale, **S. Bradshaw**. A Distributed, Parallel, Interactive Volume Rendering Package. In Proceedings of Visualization '94, Washington, D.C., October 17-21, 1994. (Acceptance ratio 40%).

Other Publications

T. J. Cradick, A. Jamieson, **S. Bradshaw**, A. McCaffrey. Zinc-Finger Nucleases Inactivating Hepatitis B Virus Genomic DNA. In the Proceedings of the 11th Annual Meeting of the American Society of Gene Therapy. 2008.

S. Bradshaw and M. Light. Getting Biologists to (Willingly) Do the Work of a Thousand Annotators. In Working Notes of the AAAI Spring Symposium on Knowledge Collection from Volunteer Contributors. 2005.

S. Bradshaw. Mapping research articles to contributions to human knowledge using citation sentences. AAG Workshop on Mapping Humanity's Knowledge and Expertise in the Digital Domain. 2005.

S. Bradshaw, M. Light. Charting excursions through bioscience literature to create review articles on the fly. AAG Workshop on Mapping Humanity's Knowledge and Expertise in the Digital Domain. 2005.

M. Light and **S. Bradshaw**. Annotating Relations to Events in Bioscience Abstracts. Poster presented at BioLink 2004.

S. Bradshaw. Search Engines. The Encyclopedia of Human Computer Interaction. William Bainbridge, Ed. Berkshire Publishing, Great Barrington, MA, 2004.

S. Bradshaw, K. Hammond. Automatically Indexing Documents: Content vs. Reference. In Proceedings of Intelligent User Interfaces 2002, San Francisco, CA, January 14-17, 2002. Poster.

S. Bradshaw and K. Hammond. Automatically Indexing Research Papers Using Text Surrounding Citations. In Working Notes of the Workshop on Intelligent Information Systems, Sixteenth National Conference on Artificial Intelligence, Orlando, FL, July 18-19, 1999.

Franklin, D. and **S. Bradshaw**. Beyond "Next Slide Please": The Use of Context and Speech in Multi-Modal Control. In Working Notes of the Workshop on Intelligent Information Systems, Sixteenth National Conference on Artificial Intelligence, Orlando, FL, July 18-19, 1999.

Invited Talks (not including conference presentations)

Can We Leverage Annotation Consensus to Read Less While Learning More? Department of Research and Development, Thomson, Inc., November 2006.

Capturing Human Information Interaction to Manage Scientific Knowledge. Indiana University School of Library and Information Science Colloquium Series, October 2005.

Carving Out and Maintaining Paths to Knowledge in Bioscience Literature. Indiana University Department of Computer Science, June 2004.

Knowledge Management and Text Mining for Bioscience Literature Search. National Science Foundation Workshop on Insights in Protist Evolutionary Biology. Iowa City, IA. May 19-21, 2004. (joint presentation with Marc Light)

Search Engine-Crawler Symbiosis: Adapting to Community Interests. Knowledge Media Institute, The Open University. Milton Keynes, England. December, 2003.

Smart Tools for Web-Based Research. Chicago Chapter of the Association for Computing Machinery, DePaul University, February 2000.

Software Development Projects

Digital Mappaemundi: Digital Mappaemundi (DM) is designed to enable scholars to edit networks of text and image data, and users to search within and link between these documents. Our data are medieval mappaemundi ("maps of the world") and their textual sources. These transdisciplinary, transmedia works provide a perfect basis for development of an extensible, open source tool useful for other humanities projects. The tool provides new interactions with our works through an interface in which the maps and geographic texts can be examined individually and relationally, that is, as a database of documents searchable for points of origin, correlation and difference. Users search across maps and texts for specific details, and results take users to exact spots on maps and in literature, and create cross-referenced lists of comparable material across documents. DM is developing extensible markup language (XML) tags to associate data with points in the images and texts, so all documents can be linked through shared content. DM will be a great boon to Medieval Studies and, from the broader perspective of the Humanities, this particular application of the tool is only the start of its potential.

Awards

2009	National Endowment for the Humanities, Digital Humanities Startup Grant for the proposal: *Digital Mappaemundi: A Resource for the Study of Medieval Maps and Geographic Texts* ($46,000).
2009	Drew International Seminar Planning Grant for the course, *Business across the Pond: The Past, Present and Future of Financial Markets in the United Kingdom and Ireland* ($5,000).
2008	Andrew Mellon Foundation grant for the proposal: *Digital Mappaemundi: Use Case Proposal* ($16,000).
2007	Presidential Initiatives Fund grant for the proposal: *The Drew Center for Software Development: A Catalyst for Multi-disciplinary Activity, Partnership with Industry, and Civic Engagement: A Pilot Study* ($3,300).
	Drew Summer Sciences Institute grant for the proposal: *Automatically Linking Related Passages in Electronic Documents* ($5,300).
2006	Experiential Learning Grant, Drew University ($500)
	Dean's Teaching Award for outstanding teaching in management sciences (Tippie College of Business, The University of Iowa)
2005	Iowa Old Gold Research Fellowship (The University of Iowa)
2004	Finalist for Best Alternate Track Paper at the 2004 World-Wide Web Conference (WWW 2004)
2000	Finalist for Best Paper at the 2000 Conference on Intelligent User Interfaces (IUI 2000)

Professional Service

Journals Refereed:
New Review of Hypermedia and Multimedia (2008)
Journal of the American Society for Information Science and Technology (JASIST) (2008)
Journal of the American Society for Information Science and Technology (JASIST) (2007)
Knowledge Engineering Review (2006)
Decision Support Systems (2005),
Communications of the ACM (2004),
E-Commerce Research Journal (2004)

Conferences Refereed:
International Conference on Intelligent User Interfaces (2008),
International Conference on Human Factors in Computing (CHI) (2008)
International Conference on Intelligent User Interfaces (2007),
ACL/ISMB Joint Workshop on Linking Biological Literature, Ontologies and Databases: Mining

Biological Semantics (2005),
International Conference on Computational Linguistics (2004),
SIGIR Workshop on Information Retrieval for Question Answering (2004),
SIGIR Workshop on Search and Discovery in Bioinformatics (2004),
IEEE International Conference on Data Mining (2004),
International Conference on Intelligent User Interfaces (2001)

Conference Organizing/Program Committees:
The Twentieth ACM Conference on Hypertext and Hypermedia (2009),
The Nineteenth ACM Conference on Hypertext and Hypermedia (2008),
International Conference on Intelligent User Interfaces (2008),
The Thirtieth Annual International ACM SIGIR Conference (2007)
International Conference on Intelligent User Interfaces (2005),
International Conference on Intelligent User Interfaces (2003)

Grant Review Panels:
National Science Foundation, Division of Information and Intelligent Systems, Digital Libraries Review Panel (2005)

University Service

Department of Math and Computer Science (Drew):
- Director, the computer science program (2006-Present)
- Oversight of internships with corporate partners (2007-Present)
- Drafted the department mission statement (2006)
- Chair, the committee to redesign the computer science curriculum. New curriculum approved to begin Fall 2007 (2006/2007)
- Chair, the committee to assess and update computing infrastructure for education and research. Two servers and projection equipment purchased. New space acquired; teamwork lab established. (2006/2007)
- Prepared and hosted numerous computer science recruiting events on campus (2006-Present).
- Organized and directed a summer research program in computer science pairing three high school students with three Drew students (2007).
- Member, faculty search committee (2007/2008).

Division I (Biology, Chemistry, Math/CS, Physics (Drew):
- Represented mathematics and computer science in a divisional initiative to increase enrollment in the sciences (2007)
- *Learning Along the Continuum* focus group of the Science Vision Planning Committee. Drafted and edited a significant fraction of the final report (2006/2007)

College of Liberal Arts/University (Drew):
- Member, Dean's Council (2009/2010)
- Member, Dean's search committee, College of Liberal Arts (2007/2008)
- Member, Academic Computer Advisory Committee (2007/2008)

- Member, Honors Oversight Committee (2007/2008)

Department of Management Sciences (Iowa):
- Member, committee to redesign the undergraduate MIS curriculum (2003-2005)
- Designer, departmental web site (2005)
- Reviewer, Ph.D. student applications (2002-2006)

College of Business (Iowa):
- Member, committee for AACSB re-accreditation (2003/2004)

University (Iowa):
- Research Computing Infrastructure Advisory Committee (2005/2006)
- Information Technology Services Help Desk KMS Strategy Steering Committee (2005)
- Iowa Informatics Initiative Grant Review Panel (2003)

Student Research Advising

Undergraduate Research:
- Andrew Scheffler (Drew, 2009)
- Blake Gideon (Drew, 2008-2009)
- Paul Becker (Drew, 2007-2009)
- Steve Wozniak (Drew, Summer 2008)
- Rose Holmes (Drew, Summer 2008)
- John O'Meara (Drew, 2007-2008)
- Scott Brandsdorfer (Drew, Summer 2007)
- Dylan Scott (Iowa, 2002-2005)
- Matt Smalley (Iowa, 2003-2005)
- Joshua Sorenson (Iowa, 2005)
- Ying Zhang (Iowa, 2003)
- Andrei Scheinkman (Northwestern, 2000)

Ph.D. Committees:
- Timothy Van Fossen (Iowa, 2005-2006)
- Matthew Smalley (Iowa, 2005-2006)
- Brian Almquist (Iowa, 2003-2006)
- Ayman Shamma (Northwestern, 2004-2005) (Now at Yahoo! Research)
- Aditya Sehgal (Iowa, 2004-2006)
- Gautam Pant (Iowa, 2003-2004) (Now at U. of Utah)
- Ding Yuan (Iowa, 2003-2006)
- Xin Ying Qiu (Iowa, 2003-2006)
- Kaan Ataman (Iowa, 2003-2006)

Courses Taught

Undergraduate	Net-Centric Computing (S2009)
	Human Interaction with Technology and Information (F2008)
	Data Structures (F2008)
	Systems Programming and Tools (F2008, F2007)
	First Year Seminar: Web 2.0 and the Future of Media, Art, and Information (F2007)
	Seminar: Applications of Computing to the Financial Industry (S2007)
	Operating Systems (S2009, F2006)
	Introduction to Computers and Computing (F2006, S2007)
	Web Mining (F2003, F2004 at Iowa)
	Introduction to Computer Programming (F2003, S2004 at Iowa)
	Information Retrieval (S2002 at Northwestern)
	Fundamentals of Computer Programming I (F1999, W2000 at Northwestern)
	Fundamentals of Computer Programming II (F1999 at Northwestern)
	Introduction to the World-Wide Web (S1997, F1997 at Chicago)
	Fundamentals of Computer Programming I (S1996 at Chicago)
Graduate	Information and Knowledge Management (S2004, F2004, S2005, S2006 at Iowa)
	Developing Decision Support Systems (S2005, S2006 at Iowa)
	Web Mining (F2003, F2004 at Iowa)
	Introduction to Computer Programming (F2003, S2004 at Iowa)
	Introduction to Quantitative Modeling and Statistical Analysis (S2003 at Iowa)
	Intelligent Information Agents (F2002 at Iowa)

Technical Proficiencies

Languages:	Java, Perl, C#, Python, Adobe Flex, C, C++, JavaScript, XUL, PHP, Visual Basic .Net, Visual Basic for Applications (VBA), SQL, XML, HTML, Lisp, Scheme
Platforms:	Windows 95/98/NT/2000/XP, Mac OS X, Linux, Solaris
Environments:	Eclipse, Visual Studio
Databases:	Oracle, Postgres, MySQL, Access
Web:	Apache, Tomcat, Internet Information Server (IIS)