

# **Bill Kules, Ph.D.**

**Assistant Professor  
School of Library and Information Science  
The Catholic University of America  
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## **EDUCATION**

Ph.D. Computer Science, University of Maryland at College Park, May 2006. Advisor: Ben Shneiderman. Dissertation title: *Supporting Exploratory Web Search with Meaningful and Stable Categorized Overviews*

M.S. Computer Science, University of Maryland at College Park, 2002. Member Phi Kappa Phi Honor Society.

B.A., Mathematics (Computer Science Concentration) and Physics, Colby College, 1986, Graduated Cum Laude, with Distinction in Mathematics/Computer Science and Physics. Received Senior Mathematics Award. Elected to Sigma Pi Sigma Honor Society (Physics).

## **ACADEMIC EXPERIENCE**

**School of Library and Information Science** **September 2006-present**  
**The Catholic University of America, Washington, DC**  
*Assistant Professor*

Teach, conduct research and perform service to the University in the areas of information technology, human-computer interaction, user interface design and usability.

**College of Information Studies** **January 2006 – December 2006**  
**University of Maryland, College Park, MD**  
*Adjunct Professor*

Taught classes in computer programming, human-computer interaction and user interface design.

**University of Maryland, College Park, MD** **October 2000 – June 2006**  
*Research Assistant*

Dissertation research investigated the use of classifications to organize meaningful overviews of web search results to support exploratory search through interactive filtering and navigation. Implemented working prototype and conducted a comparative evaluation, confirming that it helped users explore deeper within search results while remaining more organized, yielding a more stimulating and satisfying experience. Evaluation also identified ways in which searchers thought and behaved differently when categorized overviews were available, including changes in search tactics. Project website: [www.cs.umd.edu/hcil/categorizedoverview](http://www.cs.umd.edu/hcil/categorizedoverview). Research was supported by an AOL Fellowship in Human-

Computer Interaction (2003-2005) and National Science Foundation Digital Government Initiative grant (EIA 0129978) “Towards a Statistical Knowledge Network.” (2001-2002)

Coordinated development of PhotoFinder Kiosk, a public access digital photo library that supports group annotation of photos, and PhotoFinder Web, a web-based application that supports browsing and searching of annotated photos from the PhotoFinder database. PhotoFinder Web was used to develop the Photo History of SIGCHI web site ([www.sigchi.org/photohistory](http://www.sigchi.org/photohistory)). Participated in user interface design, system design, implementation and evaluation.

## **COURSES TAUGHT**

### **Information Systems in Libraries and Information Centers (LSC 555)**

Spring 2007, Fall 2007, Spring 2008, Summer 2008, Fall 2008, Spring 2009

### **Programming for Web Applications (LSC 718)**

Fall 2008

### **Special Topics: User Interface Design & Evaluation (LSC 877)**

Spring 2007, Spring 2009

### **Independent Studies Supervised**

Fall 2006 - Designing search user interfaces with PHP

Spring 2007 – Programming in C#

### **Building the Human-Computer Interface**

Fall 2006 (Taught at the College of Information Studies, University of Maryland, College Park)

### **Principles of Human-Computer Communication**

Spring 2006 (Co-taught with Dr. Ryen White at the College of Information Studies, University of Maryland, College Park)

**Short courses (1-5 day seminars):** Web-database development, Java, JavaScript, and other programming topics.

## **PROFESSIONAL EXPERIENCE**

### **Takoma Software, Inc., Takoma Park, MD**

*President*

**August 1998 - 2006**

Consults in the areas of need assessments, requirements analysis, user interface design, small-scale software development, and evaluation, with an emphasis on user-centered design and prototyping. In addition to hands-on programming in a variety of languages and environments, develops project proposals, budgets and schedules, manages projects, coordinating work with clients, vendors and other consultants. Has taught short courses in web-database development, Java, JavaScript and other programming topics. Presents at client briefings and industry forums.

### **Selected projects:**

- **Search engines:** Designed and implemented full-text and fielded search features for C-SPAN web sites to support both novice and expert searching of video and text assets. Search results provided direct, time-coded access to recorded video.
- **Bibliographic database design:** Designed bibliographic database for the scientific literature on spirituality and health.
- **Web site evaluation and redesign:** For the National Archives, conducted expert review of the Access to Archival Databases website producing a usability assessment and suggested design improvements (with Catherine Plaisant). Member of redesign team to implement suggested improvements. External usability review confirmed site improvements and redesigned site was successfully re-launched December, 2005.
- **User interface design:** For multiple clients, designed user interfaces for web and traditional GUI applications. Utilized a user-centered, iterative prototyping methodology incorporating task analysis and structured reviews to maximize usability.
- **News gathering system - Requirements analysis and system design:** Developed requirements specification to automate news gathering, production and web publishing operations for C-SPAN, a major public affairs broadcaster. Utilized collaborative and contextual inquiry techniques to analyze business processes with management and end-users, then identified automation opportunities. Developed high level design for new system and led structured reviews of the requirements specification and RFP. Critiqued vendor responses.
- **Web-database development:** For multiple clients, developed databases, data-driven web sites and supporting utilities. Utilized Linux, Unix and MS-Windows operating systems, with Apache and IIS web servers, MS Access, MS SQL Server, MySQL, and Informix databases, Perl, PHP, VBScript, Java and JSP. Performed Section 508 accessibility remediation for government client.
- **Multimedia:** Incorporated streaming video into several web sites with timecoded and record-quality transcripts. Utilized Virage search features to enable users to jump to specific timepoints in video with to-the-second accuracy.
- **Security:** Performed security reviews, worm/virus remediation, and firewall installation/configuration for clients.

**Radio Dynamics Corp., Bethesda, MD**  
*Vice President, Software Development*

**March 1995 - August 1998**

Led development team in the design and development of new software products for wireless telephony industry. Personally responsible for the design and implementation of Oracle and Informix relational databases. Developed Java and Perl-based web-database applications. Also developed Java, C, SQL and shell script utilities for data and system management on both NT and Unix platforms. Prepared client presentations, proposals, contracts, formal documentation (e.g. requirement and functional specifications).

**Selected projects:**

- Spectrum sharing software for terrestrial and satellite/earth station communication links. This multi-machine system performs RF interference analysis between point-to-point microwave communication links as well as earth stations. Implements a web-based user interface, utilizing Java, Perl and C to access Oracle database. Database and web applications are hosted on Windows NT, with interface to Linux-based computation engine.
- Database to track deployment of unlicensed PCS devices and relocation of microwave links. Implemented a fully redundant system with up-to-the-minute data replication using Informix, C and 4GL (JYACC's JAM development tool) on a pair of Sun Sparcstations.

- Designed and implemented network for geographically distributed company, including internal LAN and WAN, T1 Internet link with firewall. Configured e-mail, DNS, SOCKS, ftp, telnet, etc. for Linux and Windows NT/95 systems.

**Visa Interactive, Herndon, VA**  
**Manager, MIS Software Development**

**August 1991 - March 1995**

Led team developing and supporting electronic bill payment system and software for telemarketing, customer service, accounting and other departments. Responsible for design specifications, scheduling, coding and coordination with clients and contractors. Projects included: Developing an interface to the Federal Reserve's Automated Clearing House (ACH) for a home bill payment service; developing a customer relationship management (CRM) system using Tcl/Tk and Informix; designing X.25-based layered protocol supporting home banking service for PCs, screen-based telephones and telephone voice response systems.

**Federal Reserve Board, Washington, DC**  
**Information Systems Analyst**

**September 1989 - August 1991**

Maintained 300 node UNIX computer network, implementing the Research Division's first IP-based Internet connection. Designed and implemented a uniform windowing interface for the Research Division based on X11 R4, developing custom utilities for economists and research assistants. Audited network security, analyzed risks, recommended and implemented policy changes.

**Digital Analysis Corporation, Reston, VA**  
**Software Engineer**

**July 1986 - August 1989**

Designed, developed and documented tests for a B1 level secure implementation of UNIX by analyzing design specifications and kernel code. Led effort to design and develop commodities exchange system for bank certificates of deposit. Taught Unix shell programming course.

## **REFEREED PAPERS**

**Kules, B.,** Capra, R., Banta, M., Sierra, T. (submitted) "What Do Exploratory Searchers Look at in a Faceted Search Interface?"

**Kules, B.,** Shneiderman, B. (2008) "Users can change their web search tactics: Design guidelines for categorized overviews." *Information Processing & Management*. 44(2): 463-484.

Choi, Y., Hsieh-Yee, I., **Kules, B.** (2007) "Retrieval effectiveness of table of contents and subject headings." *Proceedings of the 7th ACM/IEEE-CS Joint Conference on Digital libraries (Vancouver, BC, Canada, June 18 - 23, 2007)*. JCDL '07. ACM Press, New York, NY. 103-104.

**Kules, B.,** Kustanowitz, J. and Shneiderman, B. (2006). "Categorizing web search results into meaningful and stable categories using Fast-Feature techniques." *Proceedings of the 6th ACM/IEEE-CS joint conference on Digital libraries, Chapel Hill, NC*. 210-219.

Shneiderman, B., Fischer, G., Czerwinski, M., Resnick, M., Myers, B., Candy, L., Edmonds, E., Eisenberg, M., Giaccardi, E., Hewett, T., Jennings, P., **Kules, B.,** Nakakoji, K., Nunamaker, J., Pausch, R., Selker, T. and Sylvan, E. (2005). "Creativity support tools: Report from a U.S. National Science Foundation sponsored workshop." *International Journal of Human-Computer Interaction*, 20 (2). 61-77.

**Kules, B.** and Shneiderman, B. (2005). "Categorized graphical overviews for Web search results: An exploratory study using U.S. government agencies as a meaningful and stable structure." *Proceedings of the Third Annual Workshop on HCI Research in MIS, December 2004, Washington, DC.*

**Kules, B.,** Kang, H., Plaisant, C., Rose, A. and Shneiderman, B. (2003). "Immediate Usability: A case study of public access design for a community photo library." *Interacting with Computers*, 16 (3), December 2004, 1171-1193.

**Kules, B.,** Shneiderman, B., Plaisant, C. (2003). "Data exploration with paired hierarchical visualizations: Initial designs of PairTrees". *Proceedings of the Digital Government Research Conference*, 255-260.

**Kules, B.,** Shneiderman, B. (2003). "Designing a metadata-driven visual information browser for federal statistics". *Proceedings of the Digital Government Research Conference*, 117-122.

Shneiderman, B., Kang, H., **Kules, B.,** Plaisant, C., Rose, A., and Rucheir, R. (August 2002). "A photo history of SIGCHI: Evolution of design from personal to public." *ACM Interactions*, 9, 3 (May 2002), 17-23.

Christian, K., **Kules, B.,** Shneiderman, B., and Youssef, A. (September 2000). "A comparison of voice controlled and mouse controlled Web browsing." *Proc. ACM ASSETS 2000 Conference*, ACM Press, New York (November 2000).

## **POSTERS AND WORKSHOP PRESENTATIONS**

**Kules, B.,** Capra, R. (submitted) "Designing Exploratory Search Tasks for User Studies of Information Seeking Support Systems." Poster

Kules, B., McDaniel, J., Banta, M. (2009). "LIS Program Expectations of Incoming Student Competencies with Information and Communications Technology." Poster presented at the Annual Conference of the Association for Library and Information Science Education (ALISE 2009).

**Kules, B.,** Capra, R. (October 2008) "Creating Exploratory Tasks for a Faceted Search Interface." Presentation at the Second Workshop on Human-Computer Interaction and Information Retrieval (HCIR 2008).

Hsieh-Yee, H., Choi, Y., **Kules, B.** (October 2007) "Searching for books and images in an OPAC: Effects of LCSH, TOC and subject domain." Poster presented at the Annual Meeting of the American Society for Information Science and Technology (ASIST 2007).

**Kules, B.** (October 2007) "Mapping the design space of faceted search interfaces." Poster presented at the Workshop on Human-Computer Interaction and Information Retrieval (HCIR 2007).

**Kules, B.** (August 2006) "Methods for evaluating changes in search tactics induced by exploratory search systems." Presentation at the ACM SIGIR 2006 Workshop on Evaluating Exploratory Search Systems, Seattle, WA. August 11, 2006.

## **REPORTS**

**Kules, B.** (2008) "Greater Yellowstone Science Learning Center Website Evaluation."

Smith, J., **Kules, B.** (2007) "Toward a design space for categorized overviews of search results." Technical Report, School of Library and Information Science, The Catholic University of America.

White, R.W, **Kules, B.** and Bederson, B.B (2006) "Exploratory search interfaces: Categorization, clustering and beyond." *SIGIR Forum*, 32, 2. 52-56.

**Kules, B.**, and Plaisant, C. (2004) "Expert Review of the National Archives Access to Archival Data (AAD) Web Site."

**Kules, B.** (2002). "A prototype visual information browser for finding federal statistics." Working paper for the GovStat project. Available at: <http://ils.unc.edu/govstat/papers.html>.

**Kules, B.** (2000). "C-SPAN Programming and Scheduling Database Project: Requirements Specification."

**Kules, B.** (1999). "C-SPAN Programming and Scheduling Database Project: Current Practices."

## **WORK IN PROGRESS**

Wilson, M., **Kules, B.**, schraefel, m., Shneiderman, B. (under revision). "From Keyword Search to Exploration: How Result Visualization Aids Discovery on the Web." Invited monograph for *Foundations and Trends in Web Science*.

**Kules, B.**, Shneiderman, B. (under revision). "Using categorized overviews to support exploratory web search: Two formative studies". *Journal of the American Society for Information Science and Technology*.

## **EDITORSHIPS**

Guest co-editor - *Communications of the ACM*, Special Section on Supporting Exploratory Search, April 2006

## **CONFERENCES AND WORKSHOPS**

Co-chair, Third Workshop on Human-Computer Information Retrieval (HCIR 2009)

Chair, Program Committee, Second Workshop on Human-Computer Information Retrieval (HCIR 2008)

Member, Program Committee, ACM/IEEE Joint Conference on Digital Libraries (JCDL 2008)

Member, Program Committee, ACM SIGCHI 2007 Workshop on Exploratory Search Evaluation

Member, Program committee, SIGIR 2006 Workshop on Evaluating Exploratory Search Systems, August 2006

Co-organizer, Workshop on Exploratory Search Interfaces: Clustering, Categorization and Beyond, June 2005

## **INVITED TALKS**

“Improving the Search Experience with Categorized Overviews.” NFAIS Annual Conference, February 2006.

“Theory of Information Visualization Tools.” George Washington University/National Security Agency Seminar on Information Visualization, May 2000.

## **GRANTS AND AWARDS**

“Investigating Gaze Behavior in Faceted Search Interfaces for Library Catalogs”, Online Computer Library Center/Association for Library and Information Science Education (OCLC/ALISE) 2009 Research Grant Award, (\$15,000), 1/2009-12/2009.

“Faceted Search Interfaces for Library Catalogs – Pilot Study”, The Catholic University of America, (\$3,420), 4/2008-10/2008.

America Online Fellowship in Human-Computer Interaction, (\$38,000/year), 7/2003-7/2004. Renewed 7/2004-7/2005.

## **OTHER PROFESSIONAL SERVICE**

Peer Reviewer

- Information Processing and Management, 2008
- Journal of the American Society for Information Science & Technology, 2007-2008
- IEEE Information Visualization Conference 2008 (IEEE InfoVis)
- Encyclopedia of Computer Science and Engineering, 2007

## **SCHOOL AND UNIVERSITY SERVICE**

Chair, SLIS Technology Committee, September 2007-present

- Wrote 3-year “SLIS Technology Strategic Plan”
- Co-wrote “Phase II of the Information Commons: A Center of Excellence for Teaching, Learning and Research”
- Advised the Dean on technology acquisition and use

Chair, SLIS Facilities Committee, September 2008-present

- Reviewing SLIS physical facilities and preparing recommendations for improvements

Co-chair, SLIS COA Standard VI (Facilities) Committee, November 2007-present

- Co-authored chapter for COA Program Presentation covering physical and technological facilities and infrastructure

Member, University Library Facilities Planning Committee, September 2008-present

Member, SLIS Curriculum Committee, September 2007-present

- Conducted and analyzed survey of technology in the SLIS curriculum, 2008
- Wrote procedure for revising required courses, 2008
- Co-authored Faculty Advising Handbook, 2007

Member, SLIS Awards/Rovelstad Committee, January 2008-present

Member, SLIS COA Standard II (Curriculum) Committee, November 2007-present

Member, SLIS COA Standard III (Faculty) Committee, November 2007-March 2008

Member, SLIS Committee on Failing Grades, September 2006-May 2007

Advisor, Association of Research Libraries (ARL) Fellows, January 2007-December 2007

## **PROFESSIONAL SOCIETIES**

Member, American Society for Information Science & Technology (ASIS&T)

Member, Association for Computing Machinery (ACM)

Member, Association for Library and Information Science Education (ALISE)

Member, International Association of Electrical and Electronics Engineers (IEEE)

Member, Special Interest Group on Computer-Human Interaction of the ACM (SIGCHI)

Member, Washington, DC Area Association for Computing Machinery Special Interest Group for  
Computer Human Interaction (DC-CHI)

Member, Washington, DC Chapter of the Usability Professionals' Association (DC-UPA)