

YAXIAO SONG

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EDUCATION

University of North Carolina at Chapel Hill

Ph.D. Candidate, Information Library Science, Jan. 2006 – Dec. 2010 (expected)

Dissertation Title: Multi-modal Surrogates for Retrieving and Making Sense of Videos: Is synchronization between the multiple modalities optimal? (**Advisor:** Dr. Gary Marchionini)

University of North Carolina at Chapel Hill

M.Sc., Statistics, Dec. 2009

Thesis Title: Statistical Analysis and Implications for automatic video summarization. (**Advisor:** Dr. Chuanshu Ji)

National University of Singapore, Singapore

M.Sc., Computer Science, June 2004

Thesis Title: Watermarking of Relational Databases (**Advisor:** Dr. Ooi Beng Chin and Dr. Mohan Kankanhalli)

Harbin Institute of Technology, China

B.S., Computer Science and Technology, July 2002

Thesis Title: A High Capacity Data Hiding Scheme Based on DFT (**Advisor:** Dr. Hongxun Yao)

RESEARCH INTERESTS

- Human Computer Interaction; User Experience; User Studies.
- Information Retrieval; Video Retrieval; Video Surrogation; Video Summarization.
- Information Representation; Metadata.
- Research Methods; Data Analytics.

PROGRAMMING SKILLS

- **Programming and Scripting:** C, PHP/MySQL, Perl, JavaScript, Bash, MATLAB.
- **Statistical Computing:** SPSS, R, SAS.

RESEARCH & WORKING EXPERIENCE

School of Information and Library Science, UNC - Chapel Hill 01/2008 - Present
Instructor
Course taught: INLS 490-01W (INLS490-153): PHP Programming.

School of Information and Library Science, UNC - Chapel Hill 01/2006 - Present
Research Assistant (Advisor: Dr. Gary Marchionini)

- Developed several new variants of video surrogates, such as audio surrogates, multimodal surrogates combining both visual and audio features, automatic skims based on transcript summarization, etc., to be used in the digital video libraries for video retrieval and sense making.
- Conducted several usability studies examining the effectiveness of multimodal surrogates for making sense of videos. Two of the studies investigate the effectiveness of visual alone, audio alone, and visual-plus-audio surrogates. Another study examines the necessity of synchronization between the audio and visual channels of the surrogates.
- Develop a general framework for multimodal surrogates for video retrieval and sense making. The framework utilizes both the audio and visual channels of the videos, investigates what audio features and visual features can be combined together to make efficient and effective surrogates, and examines the synchronization necessity between the audio and visual channels of the surrogates. The framework can give guidance to research on video surrogation involving multiple sensory channels.
- Work on the **Open Video** Project. Maintain and administer Open Video website and databases, and implement new functions and updates of the Open Video website.
- Worked on the **VidArch** Project and participated in developing a preservation framework for digital video context, improving archival decision-making and finding-aid creation and suggesting ways to leverage technology to make them more efficient and effective.

E-Book Systems Pte Ltd, Singapore 08/2004 - 01/2005
Software Development Engineer (Supervisor: Hongtao Liu)

- Developed the following software applications and handled implementation-level design, coding, and testing:
 1. **PDF Tool:** A tool for creating FlipBooks from .pdf pages or documents;
 2. **Personal Library 1.0:** Help users organize (save, categorize, remove, view) their FlipBook collections and manage downloads and online magazine subscriptions; Details can be found at <http://www.flipviewer.com/fv/fvpl.php>.
- Developed **FlipViewer 3.6** along with my colleagues. Designed user-interface, and did

feature enhancement and debugging.

School of Computing, National University of Singapore

07/2002 - 07/2004

Research Assistant (Advisor: Dr. Ooi Beng Chin and Dr. Mohan Kankanhalli)

- Proposed and implemented digital watermarking for relational databases to establish ownership of relational data. I presented a novel Individualized Watermarking scheme for relational databases. The scheme can individually identify each copy of the data distributed in the buyer-seller scenario to precisely and reliably identify the source in case of piracy. The scheme can survive a variety of attacks, including data re-sorting, subset selection and addition, as well as collusion attacks, where a set of legitimate buyers collude together to illegally tamper the watermark.
- Proposed an Invertible Watermarking scheme for protecting precision-critical databases, where there is a need to reverse the original data. The watermarking scheme can survive a variety of attacks, and is very effective with the Incremental Watermarking on the database to re-watermark only the portion of the database updated, when normal updates of the databases are frequent.
- Along with my colleagues, designed a practical data model for spatial-temporal data (moving objects), proposed index structure for the moving objects, and implemented a system for querying moving objects in a road network, ITQS: An Integrated Transport Query System.

AWARDS & HONORS

- **Louis Round Wilson Fellowship**, University of North Carolina at Chapel Hill. 2010;
- **Asheim Fellowship**, University of North Carolina at Chapel Hill. 2010;
- **SILS Carnegie Grant**, University of North Carolina at Chapel Hill. 2009;
- **SILS Teaching Fellowship**, University of North Carolina at Chapel Hill, 2009-2010;
- **Margaret Ellen Kalp Fellowship**, University of North Carolina at Chapel Hill, 2009-2010;
- **Doctoral Consortium Travel Grant**, Joint Conference on Digital Libraries (JCDL), 2009;
- **SILS Teaching Fellowship**, University of North Carolina at Chapel Hill, 2008-2009;
- **Future Faculty Fellowship**, University of North Carolina at Chapel Hill, Aug. 2007;
- **Research Assistantship**, University of North Carolina at Chapel Hill, since Jan. 2006;
- **Research Fellowship**, National University of Singapore, 2002-2003;
- **Award of Excellent Undergraduate Thesis**, Harbin Institute of Technology, 2002;
- **People's Scholarship (Top Class Honor)**, Harbin Institute of Technology, 1998-2001;
- Second prize in **National English Contest** for College Students, China, Mar. 2001;
- Second Prize in **Physics Experimental Contest**, Harbin Institute of Technology, 2000;
- **Full Scholarship** (Post Graduates), by Phillips Academy, Andover, MA, 1999;
- **First-class Scholarship for Outstanding Freshmen**, ranking top 1% of 3,000 freshmen, Harbin Institute of Technology, China, 1998;

PUBLICATIONS

Refereed Publications

- **Yaxiao Song**, Gary Marchionini, and Chiyong Oh. (2010) What are the most eye-catching and ear-catching features in the video? Implications for video summarization ([pdf](#)). In Proc. of **WWW 2010**. Apr. 26-20, 2010, Raleigh, NC, USA. pp 911-920.
- Gary Marchionini, **Yaxiao Song**, and Robert Farrell (2009). Multimedia Surrogates for Video Retrieval: Toward Combining Spoken Words and Imagery ([pdf](#)). **Journal of Information Processing & Management**, **45(6)**: 615-630 (2009).
- **Yaxiao Song** and Gary Marchionini (2007). Effects of Audio and Visual Surrogates for Making Sense of Digital Video ([pdf](#)). In Proc. of **CHI 2007**, April 28-May 03, 2007, San Jose, California, USA. pp 867-876. (**presenter**)
- Christopher A. Lee, Helen R. Tibbo, Dawne Howard, **Yaxiao Song**, Terrell Russell, Paul Jones (2006). Keeping the context: an investigation in preserving collections of digital video, ([pdf](#)). In Proc. of **JCDL 2006**, pp 363.
- Bo Huang, Zhiyong Huang, Dan Lin, Hua Lu, **Yaxiao Song** and Hongga Li (2004). ITQS: An Integrated Transport Query System ([pdf](#)), in Proc. of **ACM SIGMOD 2004**.
- **Yaxiao Song**, Minghao Cui, and Hongxun Yao (2002). A High Capacity Data Hiding Scheme Based on DFT ([pdf](#)), in Proc. of IEEE Pacific Rim Conference on Multimedia (**PCM 2002**). Hsinchu, Taiwan, December 16-18, 2002, pp 82-88. (**presenter**)
- Yongliang Liu, Wen Gao, Hongxun Yao, **Yaxiao Song** (2002). Secure Watermark Verification Scheme, in Proc. of IEEE Pacific Rim Conference on Multimedia (**PCM 2002**): Hsinchu, Taiwan, December 16-18, 2002, 477-484.
- Liu YongLiang, Hongxun Yao, Wen Gao, **Yaxiao Song**, Shaohui Liu (2002). System Identification for Nonlinear Control Using Lifted Wavelet, in Proc. of Joint Conference on Information Science (JCIS 2002), Research Triangle Park, North Carolina, USA. pp 437-441.

Doctoral Consortium (Refereed)

- **Yaxiao Song** (2009). Multi-modal Surrogates for Retrieving and Making Sense of Videos: Is Synchronization Always the Best and Necessary? **Doctoral Consortium at JCDL** (Joint Conference on Digital Libraries), Austin, Texas, June 2009.

Journal Articles (Invited)

- **Yaxiao Song** (2009). Multi-modal Surrogates for Retrieving and Making Sense of Videos: Is Synchronization Always the Best and Necessary? **Bulletin of IEEE Technical Committee on Digital Libraries** (TCDL), **Volume 5 Issue 3**, Winter 2009, ISSN 1937-7266 (Available

online: <http://www.ieee-tcdl.org/Bulletin/current/Song/song.html>).

Technical Reports

- Gary Marchionini, Helen Tibbo, Cal A. Lee, Paul Jones, Robert Capra, Gary Geisler, Terrell Russell, Chirag Shah, Laura Sheble, Sarah Jorda, **Yaxiao Song**, Dawne E. Howard, Rachael Clemens, and Brenn Hill (2009). VidArch: Preserving Video Objects and Context Final Report ([pdf](#)). In **SILS Technical Report TR-2009-01**.
- Kristin Boekelheide, Rogers Brown A., Xin Fu, Gary Marchionini, Sanghee Oh, Gershom Rogers, Billy Saelim, **Yaxiao Song**, and Fred Stutzman (2006). Audio Surrogation for Digital Video: A Design Framework ([pdf](#)). In **SILS Technical Report TR-2006-02**.

Other Publications and Works

- **Yaxiao Song** (2009) What are the most eye-catching and ear-catching features in the video? Statistical Analysis and Implications for video summarization. Master Paper, Master of Science in Statistics, University of North Carolina at Chapel Hill. Dec. 2009.
- **Yaxiao Song** (2009). Treatments Comparison of the Quantitative Real-Time PCR Results of Adenovirus and Norovirus in Recreational Waters. Statistics Consulting Report for client Lauren Thie's Master Thesis in Public Health (STOR 765 - Consulting). Mar. 2009.
- **Yaxiao Song** (2004). Watermarking Relational Databases. Master thesis, in **NUS Electronic Thesis**, National University of Singapore, 2004;

SYMPOSIUM AND COLLOQUIUM

- "How do people create video summarizes? Footstone for Automatic Video Summarization." (2009). **DSA Doctoral Symposium**, UNC-CH, Oct. 2009.
- "Independent Sampling across Channels for Multi-modal Surrogates" (2009). **Interactive Video Symposium**, UNC-Chapel Hill, Aug. 4, 2009.
- "Multi-modal Surrogates for Digital Videos: Is synchronization always the best and necessary?" **JCDL Doctoral Consortium**, Joint Conference on Digital Libraries, Austin, Texas, June 2009 (**refereed**).
- "Multimodal Surrogates for Digital Video" (2008). **DSA Doctoral Symposium**, UNC-Chapel Hill, Oct. 10, 2008.
- "Effects of Audio and Visual Surrogates for Making Sense of Digital Video" (2007). **SILS Research Colloquium**, UNC-Chapel Hill, Mar. 22, 2007.

GUEST LECTURES

- **INLS 724**: Abstracting and Indexing for Information Retrieval. Apr. 15 2009.

- **INLS 490-089:** Issues in Digital Video Retrieval. Apr. 2009.
- **INLS 623:** Database Systems I. Apr. 8, 2009; Nov. 10, 2008; Mar. 24, 2008; Apr. 4 2007.
- **INLS 720:** Metadata. Feb. 2007.

PROFESSIONAL SERVICE ACTIVITIES

Reviewer for Conferences and Books:

- **NAACL-HLT** Student Research Workshop, 2009.
- **Synthesis Lectures on Information Concepts, Retrieval, and Services.** Morgan & Claypool Publishers. 2008.
- **ACM SIGCHI** Conference. 2008.
- **ACM International Conference on Multimedia.** 2007.
- **ACM Conference on Information and Knowledge Management.** 2007.
- **ACM Conference on Information and Knowledge Management.** 2004.

Volunteer for iConference, Feb. 8-11, 2009, Chapel Hill, NC.

Profession memberships:

- ALISE Student Member
- ASIS&T Student Member
- ACM Student Member

UNIVERSITY SERVICE ACTIVITIES

- Graduate Representative and ListServ Administrator, FACSS (Friendship Association of Chinese Students and Scholars) at UNC-CH. 2006-2008.
- Graduate Representative, Student Dining Board of Directors, UNC-CH. 2006-2007.
- Chair of the Learning Unit, Student Government, Harbin Institute of Technology, 2001.

REFERENCES

Available upon request.