

Alexander Haubold

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<http://www.aquaphoenix.com>

Education:

Ph.D. in Computer Science, received May 2008

Columbia University – Graduate School of Arts and Sciences, New York, NY

Thesis: “Indexing and Browsing Unstructured Videos using Visual, Audio, Textual, and Facial Cues”; Advisor: Prof. John R. Kender.

I address analysis, index and search approaches, and UI design for a video browser for lecture, student presentation, and student meeting/interview videos. Using a prototype indexing and browsing platform, I perform extensive user studies, leading to new insights on the impact and design of video search and browsing tools.

M.S. in Computer Science, received May 2003 (GPA: 4.1 / 4.0)

Columbia University – School of Engineering and Applied Science, New York, NY

B.S. in Computer Science, received May 2001 (GPA: 3.6 / 4.0)

Columbia University – School of Engineering and Applied Science, New York, NY

Publications: (see <http://www.aquaphoenix.com/publications>)

Computer Science (thesis research):

P. Dutta, A. Haubold, “Audio-based Classification of Speaker Characteristics”, *IEEE Conference on Multimedia and Expo (ICME '09)*, June 2009.

A. Haubold, P. Dutta, J.R. Kender, “Evaluation of Video Browser Features and User Interaction with VAST MM”, *ACM Multimedia Conference (MM '08)*, October 2008, pp. 449-458.

A. Haubold, J.R. Kender, “Accommodating Sample Size Effect on Similarity Measures in Speaker Clustering”, *IEEE Conference on Multimedia and Expo (ICME '08)*, June 2008, pp. 1525-1528.

A. Haubold, J.R. Kender, “VAST MM: Multimedia Browser for Presentation Video”, *ACM Conference on Image and Video Retrieval (CIVR '07)*, July 2007, pp. 41-48.

A. Haubold, J.R. Kender, “Alignment of Speech to Highly Imperfect Text Transcriptions”, *IEEE Conference on Multimedia and Expo (ICME '07)*, July 2007, pp. 224-227.

A. Haubold, J.R. Kender, “Analysis, User Interface, and their Evaluation for Student Presentation Videos”, *IEEE Conference on Multimedia and Expo (ICME '07)*, July 2007, pp. 863-866.

A. Haubold, “Selection and Ranking of Text from Highly Imperfect Transcripts for Retrieval of Video Content”, *ACM Conference on Research and Development in Information Retrieval (SIGIR '07)*, July 2007, pp. 791-792.

A. Haubold, J.R. Kender, “Augmented Segmentation and Visualization for Presentation Videos”, *ACM Multimedia Conference (MM '05)*, November 2005, pp. 51-60.

A. Haubold, J.R. Kender, “Analysis and Visualization of Index Words from Audio Transcripts of Instructional Videos”, *IEEE International Workshop on Multimedia Content-based Analysis and Retrieval (MCBAR '04)*, December 2004, pp. 570-573.

A. Haubold, J.R. Kender, “Analysis and Interface for Instructional Video”, *IEEE Conference on Multimedia and Expo (ICME '03)*, July 2003, pp. 705-708.

Computer Science (internships):

- A. Haubold, A. Natsev, "Web-based Information Content and its Application to Concept-based Video Retrieval", *ACM Conference on Image and Video Retrieval (CIVR '08)*, July 2008, pp. 437-446.
- A. Natsev, A. Haubold, J. Tesic, L. Xie, R. Yan, "Semantic concept-based query expansion and re-ranking for multimedia retrieval", *ACM Multimedia Conference (MM '07)*, September 2007, pp. 991-1000.
- A. Haubold, M.R. Naphade, "Classification of Video Events using 4-dimensional time-compressed Motion Features", *ACM Conference on Image and Video Retrieval (CIVR '07)*, July 2007, pp. 178-185.
- M. Campbell, A. Haubold, S. Ebadollahi, M.R. Naphade, A. Natsev, J.R. Smith, J. Tesic, L.Xie, "IBM Research TRECVID-2006 Video Retrieval System", *TRECVID 2006*, November 2006.
- A. Haubold, A. Natsev, M. Naphade, "Semantic Multimedia Retrieval Using Lexical Query Expansion and Model-based Reranking", *IEEE Conference on Multimedia and Expo (ICME '06)*, July 2006, pp. 1761-1764.
- A. Amir, J. Argillander, M. Campbell, A. Haubold, G. Iyengar, S. Ebadollahi, F. Kang, M.R. Naphade, A. Natsev, J.R. Smith, J. Tesic, T. Volkmer, "IBM Research TRECVID-2005 Video Retrieval System", *TRECVID 2005*, November 2005.

Education:

- A. Haubold, "Matlab for First-year College Engineers", *Frontiers in Education Conference (FIE '07)*, October 2007, pp. F1H 7-12.
- P. Dutta, A. Haubold, "A Model for Teaching Engineering Design", *Frontiers in Education Conference (FIE '07)*, October 2007, pp. S2J 14-19.
- P. Dutta, A. Haubold, "Case Studies of two Projects pertaining to Information Technology and Assistive Devices", *Frontiers in Education (FIE '07)*, October 2007, pp. T2J 9-14.
- A. Haubold, J.R. Kender, "Introduction of Video Journals and Archives in the Classroom", *ASEE Annual Conference & Exhibition*, June 2007, AC 2007-1694.
- P. Dutta, A. Haubold, "Engineering Design via Team-based Service-Learning Projects: Case Survey of Five Unique Project Genres", *ASEE Annual Conference & Exhibition*, June 2007, AC 2007-1704.
- P. Dutta, A. Haubold, "Management and Archival for Project-based Courses", *ASEE Annual Conference & Exhibition*, June 2007, AC 2007-1692.
- P. Dutta, A. Haubold, "Use of Assessment Survey to Assign Project Teams and Roles", *ASEE Annual Conference & Exhibition*, June 2007, AC 2007-1699.

Other:

- A. Haubold, "Visualization for Periodic Population Movement between Distinct Localities". *IEEE Symposium on Information Visualization (InfoVis '03)*, October 2003.
- A. Haubold, "User Interfaces for LED Lamps". *LED Journal*, Vol. 2(2), March 2007, p. 30.
- A. Haubold, "LED Lighting Control and Interface". *Controlling Light Conference*, December 2006.

Research Experience:

Post-Doctoral Research Fellow, since July 2008

Brain Imaging Lab, Division of Child Psychiatry, NY State Psychiatric Institute, New York, NY
Researching multi-modal analysis and visualization of brain MRI, fMRI, DTI, and spectroscopy.

Graduate Student Intern, June – September 2007

Intelligent Information Analysis, IBM TJ Watson Research Center, Hawthorne, NY
Continued research on semantic visual concept-based search. Identified shortcomings in popular semantic similarity methods of computational linguistics. Researched, implemented, and evaluated alternatives based on Google word counts and large samples of web pages with significant improvement to results in TRECVID 2005, 2006, and 2007.

Graduate Research Assistant, September 2003 – May 2008

Department of Computer Science, Columbia University, New York, NY
Worked in High Level Vision Group headed by Prof. John R. Kender, specializing in analysis, segmentation, indexing, and visualization of presentation videos. This work includes defining meaningful visual, textual, and auditory cues to represent video information for improved search and user interaction through graphical interfaces, e.g. face indices to represent actors in a video, filtered keywords to represent speech, and keyframes to represent scenes. Implemented methods, designed user interfaces, and conducted extensive user studies with more than 1,000 students and a database of more than 300 hours of video. Headed effort to build the application “VAST MM Browser (Video Audio Structure Text MultiMedia Browser)” to showcase completed research. VAST MM is the first browser of its kind for unstructured videos, available at: <http://www.aquaphoenix.com/research/vastmm>.

Graduate Student Intern, June – September 2005

Intelligent Information Analysis, IBM TJ Watson Research Center, Hawthorne, NY
Researched, implemented, and tested methods for improving visual concept-based search using textual techniques. Designed, implemented, and tested a novel feature for summarizing motion in video and applying it to concept detection. Both projects were integrated into TRECVID 2005 competition, with very positive results. Along with other techniques developed by team, IBM was placed in the highest ranks for concept detection and video search in 2005 competition.

Software Researcher and Developer, June 1999 – May 2007

Media Center for Art History, Columbia University, New York, NY
Developed, implemented, user-tested, and refined a web site management tool integrated with a relational database for non-CS staff of the Art History Department. Allows the generation and management of databases without knowledge of SQL. Used extensively since 1999 for enhancing core curriculum Art Humanities courses by creating on-line image databases. More than 10,000 graduate and undergraduate students from several universities have used the web sites supported by the developed architecture on clustered servers.

Teaching Experience:

Course Instructor, “E1102 – Design Fundamentals using Advanced Computer Technologies”, September 2001 – May 2007

Columbia University – School of Engineering and Applied Science, New York, NY
Developed syllabi and tutorials, held lectures and office hours, graded projects and homeworks for course required by all first-year Engineering students. Instructional material includes technical computing with MathWorks Matlab, 3D Modeling with Alias AutoStudio,

and Finite Element Analysis and Simulation with EDS I-DEAS. 5-section course is taught to approximately 350 students per year.

Course Instructor, “W3101 – Programming Languages in Java”, September – October 2005
Columbia University – Department of Computer Science, New York, NY

Developed syllabus, course text, assignments, and projects, held lectures and graded students’ work for a course on Java Programming. Instructional material included fundamental theory on Object Oriented Programming, GUI design in AWT and Swing.

Workshop Lecturer, “Introduction to Matlab”, St. Thomas College, Pala, Kerala, India, March 17-18, 2005.

Invited to conduct a 2-day workshop covering the fundamentals of Matlab, including interface, vector and matrix arithmetic, basic audio and image processing.

Workshop Lecturer, “Image and Audio Processing using Matlab”, UAE University, Al Ain, UAE, November 21-22, 2005.

Invited to conduct a 2-day workshop covering the fundamentals of Matlab and basic signal processing in the audio and image domains.

Related Work Experience:

Lab Manager, September 2000 – May 2007

Columbia University - School of Engineering and Applied Science, New York, NY

For 7 years, managed the Gateway and CAD Labs with a total of 60 SGI (later replaced by Windows PC Workstation) machines intended for modeling and animation in Computer Science, Mechanical, Chemical, Biomedical, Civil, and Environmental Engineering. Scheduled classes and managed 15+ person staff responsible for accommodating 10+ professors and 500+ students per year in the laboratory. Set-up and managed servers, performed OS upgrades, hardware repair, software and license installations, as well as user account management. Developed and implemented custom software to aid in user account management, network monitoring, and intrusion detection. Designed and implemented a motion-sensitive camera security system with SGI workstations to monitor and record lab activity. Consistently rehired with full stipend and tuition coverage for graduate studies.

Summer Intern, Equity IT, June – August 2001

Credit Suisse First Boston, New York, NY

Developed an on-line analyst voting system in JSP, Servlets, and MySQL designed for use by medium and small sized investment and management firms.

Summer Analyst, Fixed Income, Currency and Commodities, June – August 2000

Goldman Sachs & Co, New York, NY

Developed support software for the development team in FICC research, including an automatic nightly build and result notification tool. Designed Java application to graphically evaluate statistical data for web page access times.

Co-founder and Technical Developer, 1999 - 2000

eColl Network LLP, New York, NY

Co-founded internet service company specializing on on-line services targeted at Columbia University’s student. Designed and implemented on-line tools, such as a “Used Textbook Auction”, “Restaurant Order Preparation”, and “Ride Sharing”. The web site was used by more than 2,500 students in a semester. The company and its products was finally sold to a business that offered services to a large community of universities.

Summer Intern, Center for Development in Electronics (PSE EZE PN), June – July 1998

Siemens, Vienna, Austria

Re-designed departmental web site. Investigated implementation of existing API for experimental telephone switchboard.

Community Service:

Comprehensive Math and Science Program, September 2004 - present

Designed a networked software tool to help students in grades 7 through 12 at various New York public schools prepare for the New York State Regents Exam in Mathematics. The tool provides a variety of exercises to students and collects statistics for evaluation by the teacher.

New York City Department of Parks and Recreation, Summer 2004, Summer 2006

Supervised and instructed more than 80 high school students in designing playground equipment and a greenhouse for disabled children for Marcus Garvey Park / PS79M. Successfully lead re-design, construction, and testing of full-scale wheelchair swing, which is expected to be introduced at PS79M.

Wildlife Conservation Society, September 2003 - 2005

Supervised 10-30 students on semesterly IT projects for the New York zoos. Projects include designing interactive on- and off-line tools for people with mobile, visual, and auditory disabilities, and an e-commerce prototype for an on-line shop.

Skill Set:

Programming:

C, Java, Perl, JSP, Visual Basic, Tk, SQL, Pascal, HTML/CGI

Software:

Adobe Photoshop, Adobe Premiere, Alias Studio Tools, EDS I-DEAS, Apache Web Server, MathWorks Matlab, MS Excel, MS PowerPoint, MS Word, MySQL

Systems:

UNIX: Solaris, IRIX; DOS, Windows 95/98/2000/NT

Languages:

German (fluent), French (basic)

Other:

Practical experience in machining (mills, lathes, etc.) and rapid prototyping (ABS plastic)

Personal Research Interests:

LED Lamp is a two-year project (2001-2003) involving human light perception, ultra-bright LED experimentation, tactile user interfaces, 3D modeling and rendering, rapid prototyping, electronic circuit design, and metal machining. The LED Lamp was the first-of-a-kind lamp with 504 ultra-bright LEDs of 5 colors. Various clusters of LEDs are controlled via a touchpad or a network interface. The electronic design is packaged in an industrial all-aluminum construction weighing in at 21kg. The LED Lamp was exhibited and won popularity awards at two venues (Maker Faire, 2006 and DefCon 14, 2006). It has been published in LED Journal and was presented at an LED-specific conference.

<http://www.aquaphoenix.com/hardware/ledlamp>

Pomegranates are fruit of much curiosity, in particular the belief that each pomegranate contains exactly 613 seeds. Over an extensive period (starting in 2005), I have procured over 400 pomegranates of varying geographical origin, have carefully dissected them, and have counted their seeds. While it was easy to disprove the presence of exactly 613

seeds in a fruit, the overall average remarkably turns out to be 613. I am now investigating approaches for automatically counting seeds from a photograph to replace the tremendous manual burden. Besides the statistics derived from pomegranates, I also enjoy them as a source of vitamins. This project is well referenced in various literatures.

<http://www.aquaphoenix.com/misc/pomegranate>

3D Modeling, lighting, and rendering to create virtually realistic scenes has been a hobby of mine since the year 2000. I have used Alias StudioTools for all of my work.

<http://www.aquaphoenix.com/graphics>