

WEI JIANG

CONTACT

Corporate Research and Engineering
Eastman Kodak Company
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RESEARCH INTERESTS

My research interests are content-based multimedia understanding, classification, indexing and search, machine learning, and computer vision. Specifically, my research has been focused on detecting generic semantic concepts (including objects, activities, and events) in large-scale image and video collections by multi-modality learning (*e.g.*, joint audio-visual analysis to extract audio-visual cues that effectively represent videos) and cross-domain learning (*e.g.*, using information from various data sources to help detection in the current task).

EDUCATION

Columbia University 2005 – 2010

Ph.D., Department of Electrical Engineering

Dissertation (*with Distinction*):

Advanced Techniques for Semantic Concept Detection in General Videos

Advisor: Shih-Fu Chang

Tsinghua University, PRC 2002 – 2005

M.S., Department of Automation

Thesis: A Study of Learning-based Relevance Feedback in Content-based Image Retrieval
(*Honor: Outstanding Master's Thesis Award*)

Advisor: Qionghai Dai

Tsinghua University, PRC 1998 – 2002

B.E., Department of Automation

HONORS

Ph.D. Degree with Distinction, Columbia University, 2010

Graduate Research Fellowship from Kodak, Columbia University, 2005-2010

Best Paper Runner-up, ACM Multimedia, 2009

Millman Award (Outstanding TA), Columbia University, 2008

IBM T.J. Watson Emerging Leader in Multimedia Award, 2008

Best Paper Runner-up, IEEE ICME, 2008

Golden Retrieval Award (Public's Favorite Retriever) in VideOlympics, 2008

Outstanding M.S. Thesis Award, Dept. Automation, Tsinghua University, 2005

Rockwell Scholarship, Dept. Automation, Tsinghua University, 2004

Schneider Scholarship, Dept. Automation, Tsinghua University, 2003

GE Scholarship, Dept. Automation, Tsinghua University, 2000

RESEARCH EXPERIENCE

Eastman Kodak Company, Corporate Research & Engineering 2010-present

Research Scientist

My work is focused on automatic multimedia asset management, including content-based multimedia classification and indexing, video storytelling and summarization. I am especially interested in joint audio-visual analysis to extract audio-visual cues to effectively represent videos, and in cross-domain learning to adaptively use various types of information from different sources to help manage the current multimedia data set.

Columbia University, Dept. Electrical Engineering 2005 – 2010

Graduate Research Fellow

Advisor: Shih-Fu Chang

My work is focused on content-based multimedia classification, indexing and search, with cross modality learning, cross concept learning, and cross domain learning. I proposed learning algorithms to effectively detect generic concepts (including object, location, scenery and event) from images and videos by (1) incorporating both visual and audio features; (2) taking into account the inter-conceptual relationships; and (3) utilizing previously learned knowledge from different image/video sources (domains).

Eastman Kodak Company, Kodak Research Labs 08/2008 – 12/2008

Research Intern 05/2007 – 08/2007

Advisor: Alexander C. Loui

I conducted research on three projects. First, I investigated algorithms for detecting generic semantic events like wedding and birthday in consumer photo and video collections. Second, I studied efficient features and algorithms to determine aesthetic scales of consumer photos. Third, I worked on semantic concept classification with multi-modal (audio and visual) features.

IBM T. J. Watson Research Center, Multimedia Retrieval Group 05/2008 – 08/2008

Research Intern

Advisor: Lexing Xie

I conducted research on long-term pattern discovery in image/video collections by utilizing the associated side information. I also helped to develop the media online crawling tool and the database organization tool.

Microsoft Research Asia 03/2003 – 12/2004

Research Intern

Advisor: Mingjing Li and Hongjiang Zhang

I conducted research on content-based image retrieval, focusing on effective short-term relevance feedback learning strategies, *e.g.*, online feature selection algorithms and active learning methods.

Tsinghua University, Dept. Automation 09/2002 – 07/2005

Graduate Student and Research Assistant

Advisor: Qionghai Dai

I conducted research on content-based image retrieval, focusing on region-based image retrieval, short-term and long-term (*i.e.*, memory-based) relevance feedback, and hidden semantic indexing.

TEACHING EXPERIENCE

I developed and delivered review sessions, and assisted in the preparation and grading of homework and exams. Spring 2008
Teaching Assistant, Dept. Electrical Engineering, Columbia University
Course: Digital Signal Processing
Teaching Assistant, Dept. Electrical Engineering, Columbia University Summer 2006
Course: Digital Image Processing

PUBLICATIONS

Book Chapter

- [1] **Wei Jiang**, Alexander C. Loui, Shih-Fu Chang, “Cross-domain learning for semantic concept detection in TV programs”, *to appear*, TV Content Analysis, CRC Press, Taylor Francis LLC, 2010.

Refereed Journal Articles

- [2] **Wei Jiang**, Courtenay Cotton, Shih-Fu Chang, Dan Ellis, Alexander C. Loui, “Audio-visual atoms for generic video concept classification”, *ACM Transactions on Multimedia Computing, Communications and Applications*, (TOMCCAP), Vol.6, No.3, August, 2010.
- [3] **Wei Jiang**, Guihua Er, Qionghai Dai, Jinwei Gu, “Similarity-based online feature selection in content-based image retrieval”, *IEEE Transactions on Image Processing (TIP)*, 15(3):702-712, 2006.
- [4] **Wei Jiang**, Guihua Er, Qionghai Dai, Jinwei Gu, “Hidden annotation for image retrieval with long-term relevance feedback learning”, *Pattern Recognition (PR)*, 38(11):2007-2021, 2005.

Refereed Conference Proceedings

- [5] **Wei Jiang**, Alexander C. Loui, “Audio-visual grouplet: Temporal audio-visual interactions for general video concept classification”, *ACM Multimedia*, Scottsdale, Arizona, November, 2011.
- [6] **Wei Jiang**, Alexander C. Loui, “Laplacian adaptive context-based svm for incremental video concept detection”, *ACM Multimedia Workshop on Social Media*, Scottsdale, Arizona, November, 2011.
- [7] **Wei Jiang**, Courtenay Cotton, Alexander C. Loui, “Automatic consumer video summarization by audio and visual analysis”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, July, 2011.
- [8] **Wei Jiang**, Cathleen D. Cerosaletti, Alexander C. Loui, “Automatic aesthetic value assessment in photographic images”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, July, 2010.
- [9] **Wei Jiang**, Courtenay Cotton, Shih-Fu Chang, Dan Ellis, Alexander C. Loui, “Short-term audio-visual atoms for generic video concept classification”, *ACM Multimedia*, nominated for best paper award, Beijing, October, 2009.
- [10] **Wei Jiang**, Alexander C. Loui, “Effective semantic classification of consumer events for automatic content management”, *ACM Multimedia Workshop on Social Media*,

Beijing, October, 2009.

- [11] **Wei Jiang**, Lexing Xie, Shih-Fu Chang, “Visual Saliency with side information”, *IEEE Int’l Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, pp.1765-1768, 2009.
- [12] **Wei Jiang**, Shih-Fu Chang, Tony Jebara, Alexander C. Loui, “Semantic concept classification by joint semi-supervised learning of feature subspaces and support vector machines”, *European Conf. on Computer Vision (ECCV)*, pp. 270-283, 2008.
- [13] **Wei Jiang**, Eric Zavesky, Shih-Fu Chang, Alexander C. Loui, “Cross-domain learning methods for high-level visual concept classification”, *IEEE Int’l Conf. on Image Processing (ICIP)*, pp. 161-164, 2008.
- [14] **Wei Jiang**, Alexander C. Loui, “Semantic event detection for consumer photo and video collections”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, nominated for best paper award, pp. 313-316, 2008.
- [15] Wei Liu, **Wei Jiang**, Shih-Fu Chang, “Relevance aggregation projections for image retrieval”, *ACM Int’l Conf. on Image and Video Retrieval (CIVR)*, Canada, 2008.
- [16] Apostol Natsev, **Wei Jiang**, Michele Merler, John Smith, Jelena Tešić, Lexing Xie, Rong Yan, “IBM Research TRECVID-2008 Video Retrieval System”, *NIST TRECVID Workshop*, Gaithersburg, MD, 2008.
- [17] **Wei Jiang**, Shih-Fu Chang, Alexander C. Loui, “Kernel sharing with joint boosting for multi-class concept detection”, *Int’l Workshop on Semantic Learning Applications in Multimedia in association with IEEE Int’l Conf. on CVPR*, pp. 1-8, 2007.
- [18] **Wei Jiang**, Shih-Fu Chang, Alexander C. Loui, “Context-based concept fusion with boosted conditional random fields”, *IEEE Int’l Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, (1):949-952, 2007.
- [19] Alexander C. Loui, Jiebo Luo, Shih-Fu Chang, Dan Ellis, **Wei Jiang**, Lyndon S. Kennedy, Keansub Lee, Akira Yanagawa, “Kodak's consumer video benchmark data set: Concept definition and annotation”, *ACM SIGMM Int’l Workshop on Multimedia Information Retrieval (MIR)*, pp. 245-254, 2007.
- [20] Shih-Fu Chang, Dan Ellis, **Wei Jiang**, Keansub Lee, Akira Yanagawa, Alexander C. Loui, and Jiebo Luo, “Large-scale multimodal semantic concept detection for consumer video”, *ACM SIGMM Int’l Workshop on Multimedia Information Retrieval (MIR)*, pp. 255-264, 2007.
- [21] Shih-Fu Chang, **Wei Jiang**, Akira Yanagawa, and Eric Zavesky, “Columbia University TRECVID 2007 High-Level Feature Extraction”, *NIST TRECVID Workshop*, Gaithersburg, MD, 2007.
- [22] **Wei Jiang**, Shih-Fu Chang, Alexander C. Loui, “Active context-based concept fusion with partial user labels”, *IEEE Int’l Conf. on Image Processing (ICIP)*, pp. 2917-2920, 2006.
- [23] Shih-Fu Chang, Winston Hsu, **Wei Jiang**, Lyndon Kennedy, Dong Xu, Akira Yanagawa, and Eric Zavesky, “Columbia university TRECVID-2006 video search and high-level feature extraction”, *NIST TRECVID Workshop*, Gaithersburg, MD, 2006.
- [24] **Wei Jiang**, Kap Luk Chan, Mingjing Li, HongJiang Zhang, “Mapping low-level features to high-level semantic concepts in region-based image retrieval”, *IEEE Int’l Conf. on Computer Vision and Pattern Recognition (CVPR)*, (2):244-249, 2005.
- [25] **Wei Jiang**, Guihua Er, Qionghai Dai, Jinwei Gu, “Relevance feedback learning with feature selection in region-based image retrieval”, *IEEE Int’l Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, (2):509-512, 2005.
- [26] **Wei Jiang**, Guihua Er, Qionghai Dai, “Multiple boosting svm active learning for image retrieval”, *IEEE Int’l Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, (3):421-424, 2004.
- [27] **Wei Jiang**, Guihua Er, Qionghai Dai, “Multi-layer semantic representation learning

for image retrieval”, *IEEE Int’l Conf. on Image Processing (ICIP)*, pp. 2215-2218, 2004.

- [28] **Wei Jiang**, Mingjing Li, Hongjiang Zhang, Jinwei Gu, “Online feature selection based on generalized feature contrast model”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, (3):27-30, 2004.

Theses

“Advanced Techniques for Semantic Concept Detection in General Videos”, Columbia University, May 2010.

“A Study of Learning-based Relevance Feedback in Content-based Image Retrieval”, Tsinghua University, May 2005.

PATENTS

- [1] **Wei Jiang**, Alexander C. Loui, “Video concept classification using video similarity scores”. US Patent Pending, Filed 2011.
- [2] **Wei Jiang**, Alexander C. Loui, “Video concept classification using audio-visual grouplets”. US Patent Pending, Filed 2011.
- [3] **Wei Jiang**, Alexander C. Loui, “Video summarization using audio and visual cues”. US Patent Pending, Filed 2011.
- [4] **Wei Jiang**, Alexander C. Loui, Adaptive Multimedia Semantic Concept Classification. US Patent Pending, Filed 2010.
- [5] **Wei Jiang**, Courtenay Cotton, Shih-Fu Chang, Dan Ellis, Alexander C. Loui, Video Concept Classification Using Audio-Visual Atoms, US Patent Pending, Filed 2009.
- [6] **Wei Jiang**, Alexander C. Loui, Semantic Event Detection Using Cross-Domain Knowledge, US Patent Pending, Filed 2009.
- [7] **Wei Jiang**, Alexander C. Loui, Semantic Event Detection for Digital Content Records, US Patent Pending, Filed 2008.
- [8] Shih-Fu Chang, **Wei Jiang**, Alexander C. Loui, Active Context-based Concept Fusion, US Patent, Issued May 2010.

INVITED TALKS & PRESENTATIONS

“Audio-Visual Atom: Short Term Audio-Visual Atoms for Generic Video Concept Classification,” ACM Multimedia, Beijing, China, Oct. 2009.

“Effective Semantic Classification of Consumer Events for Automatic Content Management”, ACM Multimedia Workshop on Social Media, Beijing, China, Oct. 2009.

“Multimedia Concept Classification: Cross Modality, Cross Domain, and Cross Concept”, Digital Imaging Forum, Eastman Kodak Company, Rochester, NY, Sep. 2009.

“Semantic Concept Detection: Cross Concept and Cross Modality”, *WOCC09 Multimedia Symposium*, New Jersey, May 2009.

“Multimedia Concept Detection: Cross Concept and Cross Modality”, *IBM Watson Workshop on Emerging Leaders in Multimedia*, IBM T.J. Watson Research Center, Hawthorne, NY, Oct. 2008.

“Relevance Aggregation Projections for Image Retrieval”, CIVR, Niagara Falls, July 2008.

“Columbia University TRECVID 2007 High-Level Feature Extraction”, NIST TRECVID Workshop, Gaithersburg, MD, Nov. 2007.

“Kernel Sharing with Joint Boosting for Multi-Class Concept Detection”, CVPR Workshop, Minneapolis, MN, June 2007.

PROFESSIONAL SERVICE

Peer Reviewers:

- IEEE Transactions on Image Processing, Transactions on Multimedia, Transactions on Intelligent Systems and Technology, IEEE Signal Processing Letters, ACM TOMCCAP, Journal of Mathematical Imaging and Vision, Pattern Recognition, Information Science, Computer Vision and Image Understanding, EURASIP Journal on Advances in Signal Processing
- International Conferences such as CVPR, ICIP, ICASSP, ICPR, ICME, ACM MM, CIVR, MIR, ICMR

Membership:

- IEEE Member

MISCELLANEOUS

Citizenship: People’s Republic of China

Language: fluent in English, native in Mandarin Chinese

Computer Skills: programming in C/C++ and Matlab; familiar with Python and SQL

REFERENCES

Shih-Fu Chang

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Alexander C. Loui

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