

WEI JIANG

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RESEARCH INTERESTS

Computer vision; pattern recognition; multimedia indexing and search. my current research is focused on detecting objects and events in large-scale image and video collections in both mobile and desktop environments.

EDUCATION

Columbia University 2005 – 2010

Ph.D., Department of Electrical Engineering

Thesis: Advanced Techniques for Semantic Concept Detection in General Videos

Advisor: Shih-Fu Chang

Tsinghua University 2002 – 2005

M.S., Department of Automation

Thesis: A Study of Learning-based Relevance Feedback in Content-based Image Retrieval

Advisor: Qionghai Dai

Tsinghua University 1998 – 2002

B.S., 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 VideoOlympics, 2008

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

Rockwell Scholarship, Tsinghua University, 2004

Schneider Scholarship, Tsinghua University, 2003

GE Scholarship, Tsinghua University, 2000

RESEARCH EXPERIENCE

Eastman Kodak Company, Kodak Research Labs 2010-present

Research Scientist

Content-based multimedia asset management in both mobile and desktop environments, including object and event detection in image and video collections, video storytelling and summarization, multi-modal (e.g., joint audio-visual) analysis, adaptive learning and cross-domain learning.

Columbia University, Dept. Electrical Engineering

2005 – 2010

Graduate Research Fellow Advisor: Shih-Fu Chang

Content-based multimedia classification, indexing and search, focusing on multi-modal learning (e.g., joint audio-visual analysis), multi-concept learning (e.g., inter-conceptual relationship analysis), and cross-domain learning.

Eastman Kodak Company, Kodak Research Labs

08/2008 – 12/2008

Research Intern Advisor: Alexander C. Loui

05/2007 – 08/2007

Detection of multimedia events (e.g., wedding, birthday, sports) in large-scale image and video collections. Aesthetic assessment of consumer images.

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

Research Intern Advisor: Lexing Xie

Long-term pattern discovery in image and video collections by utilizing the associated side information. Multimedia online crawling and database organization.

Microsoft Research Asia

03/2003 – 12/2004

Research Intern Advisor: Mingjing Li

Content-based image retrieval, focusing on relevance feedback learning, online feature selection, and active learning.

Tsinghua University, Dept. Automation

09/2002 – 07/2005

Graduate Student and Research Assistant Advisor: Qionghai Dai

Content-based image retrieval, focusing on region-based image analysis, memory-based relevance feedback, and hidden semantic indexing.

TEACHING EXPERIENCE

Teaching Assistant, Dept. Electrical Engineering, Columbia University Spring 2008

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,” *TV Content Analysis: Techniques and Applications*, Series: Multimedia Computing, Communication and Intelligence, CRC Press, Taylor Francis LLC, March 2012.

Refereed Journal Articles

- [2] **Wei Jiang**, Alexander C. Loui, “Video concept detection by audio-visual grouplets,” *International Journal of Multimedia Information Retrieval*, September, 2012.
- [3] **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.
- [4] **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.

- [5] **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

- [6] **Wei Jiang**, Alexander C. Loui, Phoury Lei, “A consumer video search system by audio-visual concept classification”, *IEEE CVPR Workshop on Large Scale Video Search and Mining*, Providence, Rhode Island, 2012.
- [7] **Wei Jiang**, Alexander C. Loui, “Grouplet-based distance metric learning for video concept detection”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, Melbourne, Australia, 2012.
- [8] **Wei Jiang**, Alexander C. Loui, “Audio-visual grouplet: Temporal audio-visual interactions for general video concept classification”, *ACM Multimedia*, Scottsdale, Arizona, 2011.
- [9] **Wei Jiang**, Alexander C. Loui, “Laplacian adaptive context-based svm for incremental video concept detection”, *ACM Multimedia Workshop on Social Media*, Scottsdale, Arizona, 2011.
- [10] **Wei Jiang**, Courtenay Cotton, Alexander C. Loui, “Automatic consumer video summarization by audio and visual analysis”, *IEEE Int’l Conf. on Multimedia & Expo (ICME)*, 2011.
- [11] **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.
- [12] **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, 2009.
- [13] **Wei Jiang**, Alexander C. Loui, “Effective semantic classification of consumer events for automatic content management”, *ACM Multimedia Workshop on Social Media*, Beijing, 2009.
- [14] **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.
- [15] **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)*, 2008.
- [16] **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.
- [17] **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.
- [18] Wei Liu, **Wei Jiang**, Shih-Fu Chang, “Relevance aggregation projections for image retrieval”, *ACM Int’l Conf. on Image and Video Retrieval (CIVR)*, 2008.
- [19] 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.
- [20] **Wei Jiang**, Shih-Fu Chang, Alexander C. Loui, “Kernel sharing with joint boosting for multi-class concept detection”, *CVPR Workshop on Semantic Learning Applications in Multimedia*, 2007.
- [21] **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.

- [22] 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.
- [23] 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.
- [24] Shih-Fu Chang, **Wei Jiang**, Akira Yanagawa, and Eric Zavesky, “Columbia University TRECVID 2007 High-Level Feature Extraction”, *NIST TRECVID Workshop*, Gaithersburg, MD, 2007.
- [25] **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.
- [26] Shih-Fu Chang, Winston Hsu, **Wei Jiang**, Lyndon Kennedy, Dong Xu, Akira Yanagawa, Eric Zavesky, “Columbia university TRECVID-2006 video search and high-level feature extraction”, *NIST TRECVID Workshop*, 2006.
- [27] **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)*, 2005.
- [28] **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.
- [29] **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.
- [30] **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”, *with Distinction*, Columbia University, May 2010.

“A Study of Learning-based Relevance Feedback in Content-based Image Retrieval”, *Outstanding Master's Thesis Award*, Tsinghua University, May 2005.

PATENTS

Allowed and Issued

- [1] **Wei Jiang**, Alexander C. Loui, Semantic event detection for digital content records, US Patent, Serial No 12/331927, allowed 2012.
- [2] **Wei Jiang**, Alexander C. Loui, Semantic event detection using cross-domain knowledge, US Patent, Serial No. 12/408140, allowed 2012.
- [3] **Wei Jiang**, Courtenay Cotton, Shih-Fu Chang, Dan Ellis, Alexander C. Loui, Video concept classification using audio-visual atoms, US Patent 8135221, Issued 2012.
- [4] Shih-Fu Chang, **Wei Jiang**, Alexander C. Loui, Active context-based concept fusion, US Patent 7720851, Issued 2010.

Filed and Pending

- [5] Alexander C. Loui, **Wei Jiang**, Kevin Gobeyn, Charles Parker, Audio based control of equipment and systems, US Patent Pending, Filed 2012.

- [6] Alexander C. Loui, **Wei Jiang**, Kevin Gobeyn, Charles Parker, Audio signal semantic concept classification method, US Patent Pending, Filed 2012.
 - [7] **Wei Jiang**, Alexander C. Loui, Video concept classification using temporally-correlated grouplets, US Patent Pending, Filed 2012.
 - [8] **Wei Jiang**, Alexander C. Loui, Video concept classification using video similarity scores, US Patent Pending, Filed 2011.
 - [9] **Wei Jiang**, Alexander C. Loui, Video concept classification using audio-visual grouplets, US Patent Pending, Filed 2011.
 - [10] **Wei Jiang**, Alexander C. Loui, Video summarization using audio and visual cues, US Patent Pending, Filed 2011.
 - [11] **Wei Jiang**, Alexander C. Loui, Adaptive Multimedia Semantic Concept Classification. US Patent Pending, Filed 2010.
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INVITED TALKS

“Multimedia Concept Classification by Multiple Modalities,” *CISL Distinguished Speaker Presentation*, Xerox, Rochester, NY, Mar. 2012.

“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.

PROFESSIONAL SERVICE

Peer Reviewers: Journals such as IEEE TIP, TMM, CSVT, TSP, ACM TOMCCAP, TIST, Springer JMIV, PR, IS, CVIU, etc. Conferences such as IEEE ICCV, CVPR, ICIP, ICASSP, ICPR, ICME, ACM MM, CIVR, MIR, ICMR, etc.

MISCELLANEOUS

Computer Skills: proficient in C/C++, Matlab; familiar with Python, Java, and Android

REFERENCES

Shih-Fu Chang

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Australian National University

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