FAN JIANG

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Qualifications

Self-motivated research engineer with 8+ years of experience in multimedia and computer vision
Proven technical expertise in the field of signal processing, machine learning, and pattern classification
Rich programming experience with C/C++, OpenCV, MATLAB
Excellent hands-on skills on building system of image/video processing and analysis
Demonstrated ability in working on different projects, both independently and in teams

Education

Ph.D. in Electrical Eng., 2010 (expected)   NORTHWESTERN UNIVERSITY, Evanston / IL
M.S. in Electrical Eng., 2005   TSINGHUA UNIVERSITY, Beijing / China
B.S. in Electrical Eng., 2002   TSINGHUA UNIVERSITY, Beijing / China

Experience

Research Assistant
09/2005 – present

Dept. of EECS, Northwestern University, Evanston / IL
Advisors: Prof. Aggelos K. Katsaggelos & Prof. Ying Wu
- Designed a trajectory-based video anomaly detection algorithm, including object tracking from surveillance video, unsupervised clustering, and Bayesian decision. Extended this algorithm to the interaction of multiple video objects, using data mining approaches.
- Built a video anomaly detection system using C++ and MATLAB, based on OpenCV object tracker, HMM toolbox, spectral clustering toolbox, and data mining toolkits.

Research Intern
06/2008 – 09/2008

Epson Research and Development, Inc., San Jose / CA
Advisor: Dr. Jing Xiao
- Designed a novel image/video retargeting algorithm – image or video resizing that preserves important visual content (**patent filed**).
- Wrote a program that read in any image or video clip and changed its spatial size or temporal length adaptively according to user requirement. Developed in C++ using graphics tools (2D/3D Delaunay triangulation) and mathematical optimization library (sparse matrix computation).

Research Assistant
09/2006

Motorola Labs, Schaumburg / IL & Northwestern University, Evanston / IL
Advisors: Dr. Zhu Li & Prof. Aggelos K. Katsaggelos
- Collaborated in modifying provided code using C++ to classify different types of video shot boundaries (cut/dissolve/fade in/fade out).
- Implemented machine learning system modules, including PCA feature selection and HMM-based shot boundary modeling.

Research Assistant
09/2002 – 07/2005

Dept. of EE, Tsinghua University, Beijing / China
Advisor: Prof. Yu-Jin Zhang
- Designed a content-based video parsing system for news video & home video.
- Implemented multiple image and video processing algorithms using C++ and MATLAB, including background subtraction, face detection, affine motion model.

Research Intern
07/2004

Intel China Research Center, Beijing / China
Advisor: Dr. Tao Wang
- Developed a content-based video retrieval system using C, focusing on video shot boundary detection and color feature selection.

Patents

Fan Jiang and Jing Xiao (with Epson), "Effective and Efficient Content-Aware Image/Video Resizing by Anchor Point Sampling and Mapping", U.S. Provisional Patent Application Serial No.: 61/114,886, filed Nov 2008

Computer Skills

Languages:	C/C++ (8 years), MATLAB (6 years)
Tools:	MFC, OpenCV
Environments:	Windows (Visual studio), Unix/Linux (gcc), Mac (Xcode)

Courses

Digital Signal Processing	Data Structure and Algorithms	Probabilistic Systems and Random Signals
Digital Image Analysis	Linear Algebra	Information Theory
Advanced Computer Vision	Nonlinear Optimization (Audit)	Communication System

Selected Publications

Fan Jiang, Junsong Yuan, Sotirios A. Tsaftaris, and Aggelos K. Katsaggelos, "Anomalous video event detection using spatiotemporal context," Computer Vision and Image Understanding, vol. 115, no. 3, pp. 323-333, 2011.

Lei Song, **Fan Jiang**, Zhongke Shi, and Aggelos K. Katsaggelos, "Understanding dynamic scenes by hierarchical motion pattern mining," accepted by IEEE Int'l Conf. on Multimedia and Expo, 2011.

Fan Jiang, Junsong Yuan, Sotirios A. Tsaftaris and Aggelos K. Katsaggelos, "Video anomaly detection in spatiotemporal context," IEEE Int'l Conf. on Image Process., pp. 705-708, Hong Kong, Sept 2010.

Fan Jiang, Ying Wu and Aggelos K. Katsaggelos, "A dynamic hierarchical clustering method for trajectory-based unusual video event detection," IEEE Trans. Image Process., vol. 18, no. 4, pp. 907-913, 2009.

Fan Jiang, Ying Wu and Aggelos K. Katsaggelos, "Detecting contextual anomalies of crowd motion in surveillance video," IEEE Int'l Conf. on Image Process., pp. 1117-1120, Cairo, Egypt, Nov 2009.

Fan Jiang, Ying Wu and Aggelos K. Katsaggelos, "Abnormal event detection based on trajectory clustering by 2-depth greedy search," IEEE Int'l Conf. on Acoustics, Speech, and Signal Process., pp. 2129-2132, Las Vegas / NV, Mar 2008

Fan Jiang, Ying Wu and Aggelos K. Katsaggelos, "Abnormal event detection from surveillance video by dynamic hierarchical clustering," IEEE Int'l Conf. on Image Process., vol. 5, pp. 145-148, San Antonio, TX, Sept 2007

Fan Jiang and Yu-Jin Zhang, "News video indexing and abstraction by specific visual cues: MSC and news caption," Book chapter in Video Data Management and Information Retrieval, pp. 254-281, 2004

Honors and Awards

2009 – 2010	Terminal Year Fellowship, Dept. of EECS, Northwestern University
2005 – 2006	Walter P. Murphy Fellowship, Dept. of EECS, Northwestern University
2003 – 2004, 2004 – 2005	Outstanding Graduate Student Scholarship (top 5%), Tsinghua University
2002	Outstanding Bachelor Thesis Award (top 5%), Tsinghua University
1998	Freshman Fellowship (top 10 students in every province of China), Tsinghua University