

Jingjing Liu

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Education

- **Rutgers University**, New Brunswick, NJ, 09/2011 – 2016 (expected)
Ph.D. candidate in Computer Science
Advisor: Dimitris N. Metaxas
- **Chinese Academy of Sciences**, Beijing, China, 09/2008 – 07/2011
M.S., Computer Science and Technology
- **Beihang University**, Beijing, China, 09/2003 – 07/2007
B.E., Automatic Control and Information Technology

Technical Skills

- **Programming** C, C++, Matlab, Python, HTML
- **Tools** OpenCV, MS Visual Studio C++, XCode, Caffe
- **Operation System** Windows, Linux, Mac OS X

Research Interests

- Computer Vision, Machine Learning, Image Processing

Working Experience

- **Research Assistant**, Rutgers University, New Brunswick, NJ, 07/2012 - present
- **Software Engineer Intern**, Apple Inc., Cupertino, CA, 06/2015 - 08/2015
- **Research Intern**, IBM T.J. Watson Research Center, Yorktown Heights, NY, 05/2014 - 12/2014
- **Teaching Assistant**, Rutgers University, New Brunswick, NJ, 09/2011 - 06/2012

Projects

- **IBM T.J. Watson Research Center, NY**
Advisor: Sharath Pankanti, Nanili Ratha, Quanfu Fan
 - **Face Analysis with Convolutional Neural Network (CNN)**
 - Implemented a face detector that can handle multi-scale face and diverse head pose.
 - Implemented 3D face warping that can eliminate out-of-plane image distortion.
 - Designed deep neural network (DNN) for face verification and gender classification.
 - Investigated image argument techniques for DNN on face analysis tasks.
 - **People Detection in Crowded Scenes**
 - Modeled contextual information in crowded scenes for people detection, e.g., spatial coexistence, social interactions, scale consistence, and pose proximity.
 - Constructed the contextual graph consisted of proximity and exclusion graphs that can capture multi-order and global context beyond explicit pairwise.
 - Proposed a greedy forward search approach based on modified label propagation.

- **Computational Biomedicine Imaging and Modeling (CBIM) Center, NJ**

Advisors: Dimitris N. Metaxas, Shaoting Zhang, Chao Chen

- **Facial Expression Analysis in American Sign Language (ASL)**

- Exploited non-manual events (e.g., eyebrow and periodical head movements, etc.) based on 3D face tracking to recognize grammatical marker in ASL.
- Proposed a 2-stage Conditional Random Fields (CRFs) framework to analyze temporal phases and multi-scale patterns of non-manual events.

- **Video Classification with Weakly Supervised Labeling**

- Proposed a weakly supervised algorithm to model sequential data that combines Multiple-Instance Learning (MIL) and CRFs model seamlessly.
- Achieved superior performance than other MIL-based methods on gesture and action recognition, in terms of both accuracy and efficiency.

- **Medical Image Retrieval with Unsupervised Hashing**

- Proposed an end-to-end mammogram retrieval system using unsupervised hashing method to assist traditional mammogram screening for breast cancer analysis.
- Integrated multiple features and similarity metrics by constructing composite spectral graph that improves retrieval and classification of mammographic

Selected Publication

- **Jingjing Liu**, Shaoting Zhang, Shu Wang, and Dimitris N. Metaxas. "Multispectral Deep Neural Networks for Pedestrian Detection". *British Machine Vision Conference (BMVC)*, 2016.
- **Jingjing Liu**, Shaoting Zhang, Wei Liu, Cheng Deng, Yuanjie Zheng, and Dimitris N. Metaxas. "Spatio-temporal Group Context for Pedestrian Counting", *IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)*, 2016.
- **Jingjing Liu**, Quanfu Fan, Sharath Pankanti, and Dimitris N. Metaxas. "People Detection in Crowded Scenes by Context-driven Label Propagation". *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2016. *Accepted*.
- **Jingjing Liu**, Chao Chen, Yan Zhu, Wei Liu, and Dimitris N. Metaxas. "Video Classification via Weakly Supervised Sequence Modeling". *Computer Vision and Image Understanding (CVIU)*, 2015.
- **Jingjing Liu**, Bo Liu, Shaoting Zhang, Fei Yang, Peng Yang, Dimitris N. Metaxas, and Carol Neidle. "Non-manual Grammatical Marker Recognition based on Multi-scale, Spatio-temporal Analysis of Head Pose and Facial Expressions", *Image and Vision Computing (IVC)*, Volume 32, Issue 10, Pages 671-681, 2014. *Special issue on Best of FG 2013*
- **Jingjing Liu**, Shaoting Zhang, Wei Liu, Xiaofan Zhang, and Dimitris N. Metaxas. "Scalable Mammogram Retrieval Using Anchor Graph Hashing", *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2014.
- **Jingjing Liu**, Bo Liu, Shaoting Zhang, Fei Yang, Peng Yang, Dimitris N. Metaxas, and Carol Neidle. "Recognizing Eyebrow and Periodic Head Gestures Using CRFs for Non-Manual Grammatical Marker Detection in ASL", *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2013.

Awards and Honors

- 1st Place, NIST TRECVID 2014 Surveillance Event Detection, Retrospective & Interactive Task, 2014. (4 participants)
- Best of Automatic Face and Gesture Recognition, special issue of Image and Vision Computing, 2014. (16 out of ~320 submissions)