

Xiaoming LIU

- CONTACT INFORMATION** GE Global Research, *Phone: (518) 387-4211*
KW-C212A, 1 Research Circle, *E-mail: liux@research.ge.com*
Niskayuna, NY. USA 12309 *Web: www.yubingbing.com/xiaoming*
- RESEARCH INTEREST** Computer Vision, Patter Recognition, Machine Learning, Image Processing, Multimedia Informational Retrieval.
- EDUCATION**
- Carnegie Mellon University**, Pittsburgh, PA. USA
Ph.D., Electrical and Computer Engineering **October, 2004**
 - Dissertation Title: "Pose Robust Video-Based Face Recognition"
 - Advisors: Prof. Tsuhan Chen and Prof. B.V.K. Vijaya Kumar
- Zhejiang University**, Hangzhou, Zhejiang, P.R. China
M.S., Computer Science and Engineering **March, 2000**
 - Dissertation Title: "Study on Video based Human Animation Techniques"
 - Advisor: Prof. Yueting Zhuang
- Beijing Information Technology Institute**, Beijing, P.R.China
B.A., Computer Science and Engineering **July, 1997**
- EXPERIENCE**
- Nov 2004-** Lead Computer Scientist, Visualization and Computer Vision Lab, GE Global Research, Niskayuna, NY
Jan 2000-Oct 2004 Research Assistant, Advanced Multimedia Processing Lab, Carnegie Mellon University, Pittsburgh, PA
Sep 1998-Dec 1999 Research Assistant, Intelligence CAD Lab, Zhejiang University, P.R.China
- RESEARCH PROJECTS** "Recognize Facial Action Units (AUs) from Face Video Sequences," (PI), Department of Homeland Security (DHS), \$350K, 01/10 - 09/10.
"Site-Adaptive Face Recognition at a Distance," (PI), National Institute of Justice (NIJ), \$500K, 10/07 - 12/09.
"Biometrics ID kiosk," Project Leader, Israel-U.S. Binational Industrial Research and Development (BIRD), \$250K, 6/07-12/08.
"Active 3D Face Capture," Project Leader, National Institute of Justice (NIJ), \$500K, 10/06-3/08.
- PROFESSIONAL ACTIVITIES**
- Member of IEEE**
Member of Sigma Xi
- Talks**
- Nov 2009: Image Alignment: Theory and Application, State University of New York at Albany, Albany NY.
 - Nov 2009: Image Alignment: Theory and Application, Naval Research Laboratory, Washington, DC.
 - Sep 2009: Image Alignment: Theory and Application, Artificial Intelligence Lab., Zhejiang University, Hangzhou, P.R.China.
 - Jun 2009: Improving Face Recognition with a Quality-based Probabilistic Framework, IEEE Computer Society Workshop on Biometrics (in conjunction with CVPR 2009), Miami Beach, Florida.
 - May 2008: Discriminate Image Alignment, Digital Video and Multimedia (DVMM) Lab, Columbia University, New York City, NY.
 - May 2008: Discriminate Image Alignment, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA.

- Feb 2008: Face Alignment: Algorithms and Applications, National Sensor, Surveillance and Biometric Technologies Center Of Excellence, New York City, New York.
- Aug 2007: Generative and Discriminative Face Alignment, ECSE Department, Rensselaer Polytechnic Institute, Troy, New York.
- Jun 2007: Generic Face Alignment using Boosted Appearance Model, CVPR 2007, Minneapolis, Minnesota.
- Jun 2007: Intelligent Video for Security, Northeast Technology and Product Assessment Committee (NTPAC) Corrections Conference, Sturbridge, Massachusetts.
- Apr 2007: Intelligent Video at GE, Artificial Intelligence Lab., Zhejiang University, Hangzhou, P.R.China.
- Feb 2007: Multi-view Face Enhancement and Forensic Face Recognition, Identix Inc., Jersey City, New Jersey.
- Aug 2005: Towards Intelligent Video Solutions, Robotics Institute, Carnegie Mellon University, Pittsburgh, Pennsylvania.
- Sep 2004: Pose Robust Video-Based Face Recognition, Siemens Corporate Research, Princeton, New Jersey.
- Sep 2004: Pose Robust Video-Based Face Recognition, GE Global Research, Niskayuna, New York.
- Aug 2004: Pose Robust Video-Based Face Recognition, Epson Palo Alto Lab, Palo Alto, California.
- May 2002: Shot Boundary Detection Using Temporal Statistics Modeling, ICASSP 2002, Orlando, Florida.
- Feb 2001: Face Authentication with Tolerance to Expression Variations and Registration Errors, Media Site Inc., Pittsburgh, Pennsylvania.

Program committee

- 7th Asian Conference on Computer Vision (ACCV) 2006, Hyderabad, India, January 13-16, 2006.
- IEEE workshop on Beyond Patches (in conjunction with CVPR 2006), New York, NY, June 17, 2006.
- Workshop on Non-rigid registration and tracking through learning (in conjunction with ICCV 2007), Rio de Janeiro, Brazil, October 14, 2007.
- IEEE Workshop on Motion and Video Computing (WMVC), Copper Mountain, Colorado, January 8-9, 2008.
- International Workshop on Instinctive computing, Carnegie Mellon University, Pittsburgh, PA, June 15-16, 2009.
- 1st ACM International Workshop on Interactive Multimedia for Consumer Electronics (IMCE 2009), Beijing, China, October 23, 2009.
- Video Intelligence (VI-2010), ICCS Workshop, Amsterdam, May 30, 2010.

Reviewers

- IEEE transactions on PAMI, Image Processing, Multimedia, CSVT, Medical Imaging, Information Forensics and Security, Image and Vision Computing.
- IEEE international conferences such as CVPR, ICIP, ICASSP, ICPR, ACCV, etc.

TEACHING

Carnegie Mellon University, Pittsburgh, PA.

Fall 2002 & Fall 2003 Teaching Assistant for Signal and Systems: Gave recitations, directed labs, prepared homework solutions, prepared recitation notes, and graded homework and exams.

PUBLICATIONS

Journals

1. Yan Tong, **Xiaoming Liu**, Frederick W. Wheeler, and Peter Tu, "Semi-supervised Facial Landmark Labeling," IEEE Transactions on Pattern Analysis and Machine Intelligence (under review), September 2009.
2. **Xiaoming Liu**, "Video-based Face Model Fitting using Adaptive Active Appearance Model," Image and Vision Computing, doi:10.1016/j.imavis.2009.09.016.

3. **Xiaoming Liu**, “Discriminative Face Alignment,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol.31, No.11, pp.1941-1954, November 2009.
4. **Xiaoming Liu**, Tsuhan Chen, and Susan M. Thornton, “Eigenspace Updating for Non-Stationary Process and Its Application to Face Recognition,” *Pattern Recognition*, special issue on Kernel and Subspace Methods for Computer Vision, Vol.36, No.9, pp.1945-1959, September 2003.
5. **Xiaoming Liu**, Tsuhan Chen, and B.V.K. Vijaya Kumar, “Face Authentication for Multiple Subjects Using Eigenflow,” *Pattern Recognition*, special issue on Biometric, Vol.36, No.2, pp.313-328, February 2003.
6. Yueting Zhuang, **Xiaoming Liu**, and Yunhe Pan, “A Video-based Human Skeleton Extraction Technique For Animation,” *Journal of Computer Research & Development*, Vol.37, No.4, pp.498-506, April 2000.
7. Yueting Zhuang, **Xiaoming Liu**, Yi Wu, and Yunhe Pan, “A New Approach to Retrieve Video by Example Video Clip,” *The Chinese Journal of Computers*, Vol.23, No.3, pp.300-305, March 2000.
8. Yueting Zhuang, **Xiaoming Liu**, Yunhe Pan, and Jun Yang, “Human Three Dimension Motion Skeleton Reconstruction of Motion Image Sequence,” *Journal of Computer-aided Design & Computer Graphics*, Vol.12, No.4, pp.245-250, April 2000.
9. Yunhe Pan, Yueting Zhuang, and **Xiaoming Liu**, “Video Motion Capture in VBA–Video-based Animation,” *Journal of Zhejiang University, SCIENCE*, Vol.1, No.1, pp.1-7, January 2000.
10. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, “Model Based Human Motion Tracking,” *Journal of Computer Research & Development*, Vol.36, No.10, pp.1268-1273, October 1999.
11. Yueting Zhuang, **Xiaoming Liu**, Chun Chen, Chenyu Zhang, and Weilin Lu, “GDP: The Design and Implementation of Object Oriented and Software Components Techniques,” *Computer Science*, Vol.27, No.1, pp.40-43, January 2000.

Conferences

1. **Xiaoming Liu**, Yan Tong, and Frederick W. Wheeler, “Simultaneous Alignment and Clustering for an Image Ensemble,” in *Proceeding of International Conference on Computer Vision (ICCV) 2009, Kyoto, Japan*, September 27-October 5, 2009. **(Acceptance rate 23%)**
2. Jilin Tu, **Xiaoming Liu**, and Peter Tu, “On Optimizing Subspaces for Face Recognition,” in *Proceeding of International Conference on Computer Vision (ICCV) 2009, Kyoto, Japan*, September 27-October 5, 2009. **(Acceptance rate 23%)**
3. Yan Tong, **Xiaoming Liu**, Frederick W. Wheeler, and Peter Tu, “Automatic Facial Landmark Labeling with Minimal Supervision,” in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2009, Miami Beach, Florida*, June 20-26, 2009. **(Acceptance rate 26%)**
4. Necmiye Ozay, Yan Tong, Frederick W. Wheeler, and **Xiaoming Liu**, “Improving Face Recognition with a Quality-based Probabilistic Framework,” in *Proceeding of IEEE Computer Society Workshop on Biometrics (conjunction with CVPR 2009)*, Miami Beach, Florida, June 26, 2009. **Best Paper Honorable Mention Award.**

5. Hao Wu, **Xiaoming Liu**, and Gianfranco Doretto, "Face Alignment via Boosted Ranking Models," in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2008*, Anchorage, Alaska, June 24-26, 2008. (**Oral presentation, acceptance rate 4%**)
6. **Xiaoming Liu**, Ting Yu, Thomas Sebastian, and Peter Tu, "Boosted Deformable Model for Human Body Alignment," in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2008*, Anchorage, Alaska, June 24-26, 2008. (**Acceptance rate 32%**)
7. **Xiaoming Liu** and Tsuhan Chen, "Face Mosaicing for Pose Robust Video-Based Recognition," in *Proceeding of 8th Asian Conference on Computer Vision (ACCV) 2007*, Tokyo, Japan, November 18-22, 2007. (**Acceptance rate 32%**)
8. **Xiaoming Liu** and Ting Yu, "Gradient Feature Selection for Online Boosting," in *Proceeding of International Conference on Computer Vision (ICCV) 2007*, Rio de Janeiro, Brazil, October 14-20, 2007. (**Acceptance rate 24%**)
9. Frederick Wheeler, **Xiaoming Liu**, and Peter Tu, "Multi-Frame Super-Resolution for Face Recognition," in *Proceeding of IEEE Conference on Biometrics: Theory, Applications and Systems (BTAS) 2007*, Washington D.C., September 27-29, 2007.
10. **Xiaoming Liu**, Frederick Wheeler, and Peter Tu, "Improved Face Model Fitting on Video Sequences," in *Proceeding of British Machine Vision Conference (BMVC) 2007*, Warwick, UK, September 10-13, 2007. (**Acceptance rate 39%**)
11. **Xiaoming Liu**, Nils Krahnstoever, Ting Yu, and Peter Tu, "What are Customers Looking at?" in *Proceeding of IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS) 2007*, London, UK, September 5-7, 2007. (**Oral presentation**)
12. **Xiaoming Liu**, "Generic Face Alignment using Boosted Appearance Model," in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2007*, Minneapolis, Minnesota, June 18-23, 2007. (**Oral presentation, acceptance rate 5%**)
13. Peter Tu, Rebecca Book, **Xiaoming Liu**, Nils Krahnstoever, Carl Adrian, and Phil Williams, "Automatic Face Recognition from Skeletal Remains," in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2007*, Minneapolis, Minnesota, June 18-23, 2007. (**Acceptance rate 28%**)
14. Peter Tu, Fred Wheeler, Nils Krahnstoever, Thomas Sebastian, Jens Rittscher, **Xiaoming Liu**, Amitha Perera, and Gianfranco Doretto, "Surveillance video analytics for large camera networks," in *SPIE Newsroom*, 2007.
15. Peter Tu, Gianfranco Doretto, Nils Krahnstoever, Amitha Perera, Frederick Wheeler, **Xiaoming Liu**, Jens Rittscher, Thomas Sebastian, Ting Yu, and Kevin Harding, "An Intelligent Video Framework for Homeland Protection," in *Proceedings of SPIE Defence and Security Symposium - Unattended Ground, Sea, and Air Sensor Technologies and Applications IX*, Orlando, Florida, April 9-13, 2007. (Invited paper)
16. Frederick Wheeler, **Xiaoming Liu**, Peter Tu, and Ralph Hoctor, "Multi-Frame Image Restoration for Face Recognition," in *Proceeding of IEEE Signal Processing Society Workshop on Signal Processing Applications for Public Security and Forensics (SAFE) 2007*, Washington, D.C., 2007.
17. **Xiaoming Liu**, Peter Tu, and Frederick Wheeler, "Face Model Fitting on Low Resolution Images," in *Proceeding of British Machine Vision Conference (BMVC) 2006*, Vol.3, pp.1079-1088, Edinburgh, UK, September 4-7, 2006. (**Acceptance rate 28%**)

18. **Xiaoming Liu**, Tsuhan Chen, and Jens Rittscher, "Optimal Pose for Face Recognition," in *Proceeding of IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2006*, Vol.2, pp.1439-1446, New York, NY, June 17-22, 2006. **(Acceptance rate 28%)**
19. Rodney Goh, Lihao Liu, **Xiaoming Liu**, and Tsuhan Chen, "The CMU Face In Action (FIA) Database," in *Proceeding of IEEE International Workshop on Analysis and Modeling of Faces and Gestures, held in conjunction with ICCV-2005*, pp.255-263, Beijing, China, October 16, 2005.
20. **Xiaoming Liu**, Peter Tu, Jens Rittscher, Amitha Perera, and Nils Krahnstoeber, "Detection And Counting Of People In Surveillance Applications," in *Proceeding of IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS) 2005*, Teatro Sociale, Como, Italy, September 15-16, 2005.
21. **Xiaoming Liu** and Tsuhan Chen, "Pose-Robust Face Recognition Using Geometry Assisted Probabilistic Modeling," in *Proceeding of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2005*, Vol.1, pp.502-509, San Diego, CA, June 20-25, 2005. **(Acceptance rate 28%)**
22. **Xiaoming Liu** and Tsuhan Chen, "Online Modeling and Tracking of Pose-Varying Faces in Video," in *Video Proceedings of the Computer Vision and Pattern Recognition Conference (CVPR) 2005*, San Diego, CA, June 20-25, 2005.
23. **Xiaoming Liu** and Tsuhan Chen, "Pose Robust Face Recognition Based on Mosaicing –An Example Usage of Face In Action (FIA) Database," in *Demo session of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2004*, Washington, D.C., June 27-July 2, 2004.
24. **Xiaoming Liu** and Tsuhan Chen, "Geometry-assisted Statistical Modeling for Face Mosaicing," in *Proceeding of the IEEE International Conference on Image Processing (ICIP) 2003*, Vol.2, pp.883-886, Barcelona, Spain, 2003.
25. **Xiaoming Liu** and Tsuhan Chen, "Video-Based Face Recognition Using Adaptive Hidden Markov Models," in *Proceeding of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2003*, Vol.1, pp.340-345, Madison, Wisconsin, June 16-22, 2003. **(Acceptance rate 23%)**
26. **Xiaoming Liu** and Tsuhan Chen, "Shot Boundary Detection Using Temporal Statistics Modeling," in *Proceeding of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2002*, Vol.4, pp.3389-3392, Orlando, Florida, May 13-17, 2002. **(Oral presentation)**
27. **Xiaoming Liu**, Tsuhan Chen, and B.V.K. Vijaya Kumar, "On Modeling Variations For Face Authentication," in *Proceedings of the International Conference on Automatic Face and Gesture Recognition 2002*, pp.384-389, Washington D.C., May 20-21, 2002.
28. Tsuhan Chen, Yu-Feng Hsu, **Xiaoming Liu**, and Wende Zhang, "Principle Component Analysis and its Variants for Biometrics," in *Proceedings of the IEEE International Conference on Image Processing (ICIP) 2002*, Vol.1, pp.61-64, Rochester, NY, September 2002.
29. Yueting Zhuang, **Xiaoming Liu**, and Yunhe Pan, "Construct Semantic Net For Video Database," in *Proceeding of First International Workshop on Intelligent Multimedia Computing and Networking*, Taj Mahal, Atlantic City, New Jersey, February 27-March 3, 2000. (Invited paper)
30. Yueting Zhuang, **Xiaoming Liu**, and Yunhe Pan, "Apply Semantic Template to Support Content-based Image Retrieval," in *Proceedings of SPIE Vol.3972, Storage and Retrieval for Media Databases 2000*, San Jose, California, January 26-28, 2000.

31. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, "Webscope-CBVR: A Customized Content-based Search Engine for Video on WWW," in *Proceedings of SPIE Vol.3974, Image and Video Communications and Processing 2000*, San Jose, California, January 23-28, 2000.
32. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, "Semantic Template: A Robust Approach to Support Content-based Image Retrieval," in *Proceeding of The 6th International Conference on Computer-Aided Design and Computer Graphics (CAD/Graphics) 1999*, Shanghai, China, December 1-5, 1999.
33. Yueting Zhuang, **Xiaoming Liu**, and Yunhe Pan, "Query By Video Clip," in *Proceeding of The 6th International Conference on Computer-Aided Design and Computer Graphics (CAD/Graphics) 1999*, Shanghai, China, December 1-5, 1999.
34. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, "Video Based Human Animation Technique," in *Proceeding of The 7th ACM International Multimedia Conference (Multimedia 1999)*, Orlando, Florida, October 30-November 5, 1999. (**Oral presentation, acceptance rate 18%**)
35. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, "A New Approach to Retrieve Video by Example Video Clip," in *Proceeding of The 7th ACM International Multimedia Conference (Multimedia 1999)*, Orlando, Florida, October 30-November 5, 1999.
36. Yueting Zhuang, **Xiaoming Liu**, and Yunhe Pan, "Video Motion Capture Using Feature Tracking and Skeleton Reconstruction," in *Proceeding of IEEE International Conference on Image Processing (ICIP) 1999*, Vol.4, pp.232-236, Kobe, Japan, October 25-28, 1999.
37. **Xiaoming Liu**, Yueting Zhuang, Yi Wu, and Yunhe Pan, "Video Based Human Motion Capture," in *Proceeding of IEEE Workshop on Multimedia Signal Processing*, Copenhagen, Denmark, September 13-15, 1999.
38. **Xiaoming Liu**, Yueting Zhuang, and Yunhe Pan, "Content-based Video Retrieval by Example Clip on WWW," in *Proceeding of 5th Eurographics International Workshop on Multimedia (EG MULTIMEDIA 1999)*, Milan, Italy, September 7-8, 1999.