

Qi Zhao

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Female, F1 visa

RESEARCH INTERESTS Computer Vision
Statistical Learning and Pattern Recognition
Computational Neuroscience
Intelligent Robotics
Bio-Signal Processing and Biomedical Image Analysis

EDUCATION **University of California, Santa Cruz, CA** 2004 - 2009 (expected)
Ph.D. candidate, Computer Engineering
Advisor: Professor Hai Tao
Cumulative GPA: 4.0/4.0
Zhejiang University, Hangzhou, Zhejiang, China 2000 - 2004
B.S., Mixed Honors Class, Computer Science
Advisor: Professor Chun Chen
Cumulative GPA: 3.9/4.0

PUBLICATIONS **JOURNAL ARTICLES**

1. Qi Zhao and Hai Tao, "Differential Earth Mover's Distance with Its Applications to Visual Tracking," to appear in *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*.
2. Zhi Yang*, Qi Zhao* and Wentai Liu, "Neural Signal Classification Using a Simplified Feature Set with Energy Based Nonparametric Clustering," to appear in *Neurocomputing*.
*Equal authorship.
3. Zhi Yang, Qi Zhao and Wentai Liu, "Improving Spike Separation Using Waveform Derivative," to appear in *Journal of Neural Engineering (JNE)*.
4. Qi Zhao and Hai Tao, "A Motion Observable Representation Using Color Correlogram and Its Applications to Tracking," in *Computer Vision and Image Understanding (CVIU)*, Volume 113, Issue 2, Pages 273-290, February 2009.
5. Mingli Song, Qi Zhao, Jiajun Bu and Chun Chen, "An Efficient Method of Face Texture Mapping Directed to Portable Devices," in *Journal of Computer Aided Design and Computer Graphics*, Volume 17, Issue 12, Pages 2670-2675, 2005.

REFERRED CONFERENCE PAPERS

6. Qi Zhao, Zhi Yang, Hai Tao and Wentai Liu, "Evolving Mean Shift Clustering," to appear in *Asian Conference on Computer Vision (ACCV Oral Presentation)*, Xi'an, China, September 2009. (acceptance rate = $36/670 = 5.4\%$)
7. Zhi Yang, Qi Zhao and Wentai Liu, "Energy Based Evolving Mean Shift Algorithm for Neural Spike Classification," to appear in *IEEE Engineering in Medicine and Biology Society (EMBS Oral Presentation)*, Minnesota, USA, September 2009.
8. Zhi Yang, Qi Zhao and Wentai Liu, "Spike Feature Extraction Using Informative Samples," *Advances in Neural Information Processing Systems (NIPS Poster Spotlight Presentation)*, Pages 1865-1872, Vancouver, B.C., Canada, December 2008. (acceptance rate = $123/1022 = 12.0\%$)

9. Cha Zhang, Zicheng Liu, Zhengyou Zhang and Qi Zhao, "Semantic Saliency Driven Camera Control for Personal Remote Collaboration," in *Workshop on Multimedia Signal Processing (MMSP)*, Cairns, Queensland, Australia, October 2008.
10. Qi Zhao and Hai Tao, "Motion Observability Analysis of the Simplified Color Correlogram for Visual Tracking," in *Asian Conference on Computer Vision (ACCV Oral Presentation)*, Volume 4843, Pages 345-354, Tokyo, Japan, November 2007.
11. Qi Zhao, Shane Brennan and Hai Tao, "Differential EMD Tracking," in *IEEE International Conference on Computer Vision (ICCV Oral Presentation)*, Rio de Janeiro, Brazil, October 2007. (acceptance rate = $47/1190 = 3.9\%$)
12. Feng Tang, Shane Brennan, Qi Zhao and Hai Tao, "Co-Tracking Using Semi-Supervised Support Vector Machines," in *IEEE International Conference on Computer Vision (ICCV)*, Rio de Janeiro, Brazil, October 2007. (acceptance rate = $280/1190 = 23.5\%$)
13. Qi Zhao, Jinman Kang, Hai Tao and Wei Hua, "Part Based Human Tracking in a Multiple Cue Fusion Framework," in *International Conference on Pattern Recognition (ICPR)*, Volume 1, Pages 450-455, Hongkong, China, August 2006.
14. Qi Zhao and Hai Tao, "Object Tracking Using Color Correlogram," in *IEEE Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance (VS-PETS) in conjunction with ICCV*, pp. 263-270, Beijing, China, October 2005.
15. Qi Zhao, Jiajun Bu and Mingli Song, "Toward Talking Face on Portable Device - A Flexible and Realistic Approach," in *IEEE TENCON*, Volume 1, Pages 587-590, Chiang Mai, Thailand, November 2004.

RESEARCH
EXPERIENCE

University of California, Santa Cruz

Santa Cruz, CA

Research Assistant, Computer Vision Laboratory

09/2004 - present

Advisor: Professor Hai Tao

- Proposed a gradient descent method for fast matching when the Earth Mover's Distance (EMD) is employed as a similarity measure. Applied the differential EMD algorithm to visual tracking and achieved increased accuracy with speedup at orders of magnitude.
- Co-designed a new spike feature extraction algorithm that targets real-time neural signal processing. The proposed theoretical framework includes neuronal geometry signatures, noise shaping, and informative sample selection. A preliminary IC implementation of the algorithm has been fabricated.
- Proposed a nonparametric evolving mean shift clustering algorithm. The new method proves to converge exponentially (usually in a couple of iterations) and demonstrates improved accuracy when tested extensively on image segmentation and neural spike sorting.
- Designed a color correlogram based representation and analyzed its motion observability. Developed a real-time tracker using the representation, which demonstrates to be efficient, motion observable and robust against appearance variations.

Google Research

New York, NY

Research Intern, Research Group

06/2008 - 08/2008

Worked with Sanjiv Kumar and Henry Rowley

- Designed and implemented a real-time face tracking algorithm, combining the merits of both face-specific and generic trackers using importance sampling. Results on YouTube data and other real-world videos show substantial improvement over previous methods.

Microsoft Research Redmond

Redmond, WA

Research Intern, Communication and Collaboration Systems Group

06/2007 - 09/2007

Worked with Cha Zhang and Zhengyou Zhang

- Proposed and implemented real-time algorithms for personal remote collaboration. A camera combo with one fisheye camera and one Pan-Tilt-Zoom camera is used to capture general objects of interests in the collaborative office scenarios.

Vidient Systems Incorporated Santa Clara, CA
 Engineering Intern, Video Group 06/2005 - 09/2005
 Worked with Wei Hua and Jinman Kang

- Designed and implemented a human part based tracking algorithm for SmartCatch, a real-time video surveillance system. Challenging issues in multiple human tracking such as sharp motion changes and multi-person confusions are handled satisfactorily.

Microsoft Research Asia Beijing, China
 Research Intern, Multimodal User Interface Group 08/2003 - 12/2003
 Worked with Zhouchen Lin

- Participated in the Microsoft Digital Ink project. Analyzed user inputs and designed algorithms to remove redundant strokes and clarify input words prior to digital ink recognition. The system is effective in cleaning the ink note as well as increasing the recognition rate.

Zhejiang University Hangzhou, China
 Research Assistant, Microsoft Visual Perception Laboratory 03/2002 - 07/2004
 Advisor: Professor Chun Chen

- Designed and developed an efficient texture mapping method for portable devices.
- Developed and optimized video transition algorithms for the Arcsoft Family Video Editor.

SELECTED
 EXTERNAL
 TALKS

“Robust Face Tracking in Real-World Videos”

- Google Research, New York, NY, August 2008

“Differential EMD Tracking”

- Google Research, New York, NY, June 2008
- International Conference on Computer Vision, Rio de Janeiro, Brazil, October 2007
- Microsoft Research, Redmond, WA, August 2007

“Motion Observability Analysis of the Simplified Color Correlogram for Visual Tracking”

- Asian Conference on Computer Vision, Tokyo, Japan, November 2007

“Tracking People with High Resolution Views and Pose Estimations”

- Microsoft Research, Redmond, WA, September 2007

“Multiple Object Tracking for Real-Time Surveillance Systems”

- Vidient Systems Incorporated, Santa Clara, CA, September 2005

SELECTED
 AWARDS

Mei Wang Graduate Fellowship, University of California, Santa Cruz 2005
 Chancellor’s Fellowship, University of California, Santa Cruz 2004
 Graduation with Honor, Zhejiang University 2004
 Distinguished Thesis Award, Zhejiang University 2004
 Outstanding Leadership Award, Zhejiang University 2002
 Kuai Wei Fellowship, Zhejiang University 2002
 Outstanding Student Fellowship, Zhejiang University 2000 - 2003

PROFESSIONAL
 SERVICES /
 LEADERSHIP

Reviewer for *Neurocomputing* 2007 - present
 Reviewer for *Machine Vision and Applications* 2006 - present
 Conference paper reviewer for *IEEE Engineering in Medicine and Biology Society 2009, European Conference on Computer Vision 2008, IEEE Conference on Computer Vision and Pattern Recognition 2008, IEEE International Conference on Image Processing 2007, European Conference on Computer Vision 2006, IEEE International Conference on Computer Vision 2005*
 President of Chinese Student and Scholar Association, University of California, Santa Cruz 2005 - 2007
 Member in IEEE 2003 - present

COMPUTER SKILLS Programming: C/C++, Matlab
 Operating Systems: Windows, Linux/Unix
 Libraries: OpenCV, IPL, DirectX, OpenGL
 Tools: Maple, Latex, Visio, Camtasia

REFERENCES Available upon request.