

Xiaolei “Sharon” Huang

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Comp. Sci. and Engr. Dept.
Lehigh University
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<http://www.cse.lehigh.edu/~huang/>

RESEARCH INTERESTS

Biomedical Image Analysis, Computer Vision, Computer Graphics, Machine Learning

EDUCATION

Rutgers, the State University of New Jersey, New Brunswick, NJ, 2001 – 2006
Ph.D. in Computer Science, Awarded May 2006

Rutgers, the State University of New Jersey, New Brunswick, NJ, 1999 – 2001
M.S. in Computer Science, May 2001

Tsinghua University, Beijing, China, 1994 – 1999
B.E. in Computer Science, June 1999

PROFESSIONAL EXPERIENCE

Assistant Professor, Lehigh University, Bethlehem, PA, 08/2006 – present
Staff Scientist, Siemens Medical Solutions USA, Inc., Malvern, PA, 08/2005 - 08/2006
Research Assistant, Rutgers University, New Brunswick, NJ, 08/2002 – 06/2005
Teaching Assistant, Rutgers University, New Brunswick, NJ, 08/1999 – 05/2002
Summer Intern, Siemens Corporate Research, Inc., Princeton, NJ, 2001 and 2003
Research Programmer, Tsinghua University, Beijing, China, 1998-1999

PUBLICATIONS

Articles in Refereed Journals

H. Li, T. Shen, X. Huang, “Approximately Global Optimization for Robust Alignment of Generalized Shapes,” To appear in *IEEE Trans. on Pattern Analysis and Machine Intelligence* (TPAMI), in press.

T. Shen, H. Li, X. Huang, “Active Volume Models for Medical Image Segmentation,” To appear in *IEEE Trans. on Medical Imaging* (TMI), in press.

W. Wang, X. Huang, A. Esmaili, “Texture Based Foam Segmentation and Analysis,” To appear in *Industrial & Engineering Chemistry Research*, in press.

M. B. Smith, H. Li, T. Shen, X. Huang, E. Yusuf, D. Vavylonis, “Segmentation and Tracking of Cytoskeletal Filaments using Open Active Contours,” In *Cytoskeleton*, Vol. 67, No. 11, pp. 693-705, November 2010.

M. Cheng, F. L. Zhang, N. J. Mitra, X. Huang, S. M. Hu, “RepFinder: Finding Approximately Repeated Scene Elements for Image Editing,” In *ACM Trans. on Graphics*, Vol. 29, No. 4, 2010. Also in *SIGGRAPH*, 2010.

Y. Zhu, X. Huang, W. Wang, D. Lopresti, L. R. Long, S. Antani, Z. Xue, G. Thoma, “Balancing the Role of Priors in Multi-Observer Segmentation Evaluation,” In *Journal of Signal Processing Systems: Special Issue on Biomedical Imaging*, 55(1-3):185-207, Springer New York, 2009.

X. Huang, D. Metaxas, “Metamorphs: Deformable Shape and Appearance Models,” In *IEEE Trans. Pattern Analysis and Machine Intelligence* (TPAMI), Vol. 30, No. 8, pp. 1444-1459, 2008.

X. Huang, N. Paragios, D. Metaxas, “Shape Registration in Implicit Spaces using Information Theory and Free Form Deformations,” In *IEEE Trans. on Pattern Analysis and Machine Intelligence* (TPAMI), Vol. 28, No. 8, pp. 1303-1318, 2006.

Y. Wang, X. Huang, C.-S. Lee, S. Zhang, Z. Li, D. Samaras, D. Metaxas, A. Elgammal, and P. Huang, "High Resolution Acquisition, Learning and Transfer of Dynamic 3-D Facial Expressions," In *Computer Graphics Forum*, 23(3):677-686, 2004. Also in *Eurographics*, 2004.

Book Chapters

T. Shen, S. Zhang, J. Huang, X. Huang, D. Metaxas, "Integrating Shape and Texture in 3D Deformable Models: From Metamorphs to Active Volume Models," In *Multi Modality State-of-the-Art Medical Image Segmentation and Registration Methodologies*, Volume I, Chapter 1, A.S. El-Baz, R. Acharya U, and M. Mirmehdi (Editors), Springer, March 2011.

X. Huang, G. Tsechpenakis, "Medical Image Segmentation," In *Information Discovery on Electronic Health Records*, V. Hristidis (Editor), Chapman & Hall, Chapter 10, 2009.

Z. Qian, X. Huang, L. Axel, D. Metaxas, "Automatic Segmentation of Cardiac Tagged MRI," In *Biomedical Image Analysis: Methodologies and Applications*, N. Paragios, J. Duncan, and N. Ayache (Editors), Springer, 2011.

X. Huang, C. Xu, Y. Song, "Fast Nonrigid Image Registration using Salient Region Feature and Free Form Deformations," In *Encyclopedia of Healthcare Information Systems*, N. Wickramasinghe and E. Geisler (Editors), Medical Information Science Reference, 2008.

D. Metaxas, X. Huang, T. Chen, "Integrating Shape and Texture in Deformable Models: From Hybrid Methods to Metamorphs," In *Mathematical Models in Computer Vision: The Handbook*, N. Paragios, Y. Chen and O. Faugeras (Editors), Springer, 2005.

N. Paragios, M. Taron, X. Huang, M. Rousson, and D. Metaxas, "On the Representation of Shapes Using Implicit Functions," In *Statistics and Analysis of Shapes*, H. Krim and A. Yezzi (Editors), Springer Verlag, 2005.

Selected Refereed Conference Papers

H. Li, T. Shen, X. Huang, "Actin Filament Segmentation Using Dynamic Programming," to appear in *Proc. of 22nd International Conf. on Information Processing in Medical Imaging (IPMI)*, 2011. (Oral presentation)

E. Kim, X. Huang, J. Heflin, "Finding VIPS - A Visual Image Persons Search Using a Content Property Reasoner and Web Ontology," to appear in *Proc. of IEEE International Conf. on Multimedia & Expo (ICME)*, 2011.

M. Cheng, G. X. Zhang, N. J. Mitra, X. Huang, S. M. Hu, "Global Contrast based Salient Region Detection," to appear in *Proc. of IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2011.

H. Li, T. Shen, D. Vavylonis, X. Huang, "Actin Filament Segmentation Using Spatiotemporal Active-Surface and Active-Contour Models," In *Proc. of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 86-94, 2010. (Oral presentation)

H. Li, E. Kim, X. Huang, L. He, "Object Matching with a Locally Affine-Invariant Constraint," In *Proc. of IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 1641-1648, 2010.

J. Huang, X. Huang, D. Metaxas, "Learning with Dynamic Group Sparsity," In *Proc. of IEEE International Conf. on Computer Vision (ICCV)*, pp. 64-71, 2009. (Oral presentation)

T. Shen, X. Huang, "3D Medical Image Segmentation by Multiple-Surface Active Volume Models," In *Proc. of the 12th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-5762, pp. 1059-1066, 2009. (Poster of the day award, September 23, 2009)

H. Li, T. Shen, D. Vavylonis, X. Huang, "Actin Filament Tracking Based on Particle Filters and Stretching Open Active Contour Models," In *Proc. of the 12th International Conf. on Medical*

Image Computing and Computer Assisted Intervention (MICCAI), LNCS-5762, pp. 673-681, 2009.

H. Li, T. Shen, X. Huang, "Global Optimization for Alignment of Generalized Shapes," In *Proc. of the IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 856-863, 2009.

T. Shen, H. Li, Z. Qian, X. Huang, "Active Volume Models for 3D Medical Image Segmentation," In *Proc. of the IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 707-714, 2009.

J. Huang, Z. Qian, X. Huang, D. Metaxas, L. Axel, "Tag Separation in Cardiac Tagged MRI," In *Proc. of the 11th Annual International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-5242, pp. 289-297, 2008.

T. Shen, Y. Zhu, X. Huang, J. Huang, D. Metaxas, L. Axel, "Active Volume Models with Probabilistic Object Boundary Prediction Module," In *Proc. of the 11th Annual International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-5241, pp. 331-341, 2008.

J. Huang, X. Huang, D. Metaxas, "Simultaneous Image Transformation and Sparse Representation Recovery," In *Proc. of the IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 1-8, 2008.

J. Huang, X. Huang, D. Metaxas, "Optimization and Learning for Registration of Moving Dynamic Textures," In *Proc. Of IEEE International Conf. on Computer Vision (ICCV)*, pp. 1-8, 2007. (Oral presentation)

J. Huang, X. Huang, D. Metaxas, and L. Axel, "Adaptive Metamorphs Model for 3D Medical Image Segmentation," In *Proc. of the 10th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 302-310, 2007.

L. Wolf, X. Huang, I. Martin, and D. Metaxas, "Patch-based Texture Edges and Segmentation," In *Proc. of the 9th European Conf. on Computer Vision (ECCV)*, LNCS 3952, pp. 481-493, 2006.

W. He, X. Huang, D. Metaxas, and X. Ying, "Efficient Learning by Combining Confidence-rated Classifiers to Incorporate Unlabeled Medical Data," In *Proc. of the 8th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-3749, pp. 745-752, 2005. (Oral presentation)

X. Huang, D. Metaxas, and T. Chen, "Metamorphs: Deformable Shape and Texture Models," In *Proc. of the IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 496-503, 2004. (Oral presentation)

X. Huang, Z. Li, and D. Metaxas, "Learning Coupled Prior Shape and Appearance Models for Segmentation," In *Proc. of the 7th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-3216, pp. 60-69, 2004. (Oral presentation)

X. Huang, N. Paragios, and D. Metaxas, "Establishing Local Correspondences towards Compact Representations of Anatomical Structures," In *Proc. of the 6th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS-2879, pp. 926-934, 2003.

M. Singh, and X. Huang, "Computing Layered Surface Representations: An Algorithm for Detecting and Separating Transparent Overlays," In *Proc. of the IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 11-18, 2003.

Other Refereed Conference and Workshop Papers

T. Xu, H. Li, T. Shen, N. Ojicic, D. Vavylonis, X. Huang, "Extraction and Analysis of Actin Networks based on Open Active Contour Models," to appear in *Proc. of the IEEE Int'l Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, 2011.

- Y. Yu, J. Huang, S. Zhang, C. Restif, X. Huang, D. Metaxas, "Group Sparsity based Classification for Cervigram Segmentation," to appear in *Proc. of the IEEE Int'l Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), 2011.
- S. Zhang, J. Huang, M. Uzunbas, T. Shen, F. Delis, X. Huang, N. Volkow, P. Thanos, D. Metaxas, "3D Segmentation of Rodent Brain Structures using Active Volume Model with Shape Priors," to appear in *Proc. of the IEEE Int'l Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), 2011. (Oral presentation)
- E. Kim, T. Shen, X. Huang, "A Parallel Cellular Automata with Label Priors for Interactive Brain Tumor Segmentation," In *Proc. of 23rd IEEE International Conf. on Computer-Based Medical Systems* (CBMS), 2010. (Oral presentation)
- S. Zhang, J. Huang, D. Metaxas, W. Wang, X. Huang, "Discriminative Sparse Representations for Cervigram Image Segmentation," In *Proc. of the IEEE Int'l Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 133-136, 2010.
- E. Kim, W. Wang, H. Li, X. Huang, "A Parallel Annealing Method for Automatic Color Cervigram Image Segmentation," In *Proc. of the MICCAI-GRID Workshop: Medical Imaging on GRID, HPC and GPU Infrastructures*, 2009.
- D. Lopresti, X. Zhou, X. Huang, G. Tan, "Document Analysis Support for the Manual Auditing of Elections," In *Proc. of the 10th International Conf. on Document Analysis and Recognition* (ICDAR), pp. 733-737, 2009.
- H. Li, T. Shen, M. B. Smith, I. Fujiwara, D. Vavylonis, and X. Huang, "Automated Actin Filament Segmentation, Tracking, and Tip Elongation Measurements based on Open Active Contour Models," In *Proc. of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 1302-1305, 2009. (Oral presentation)
- W. Wang, Y. Zhu, X. Huang, D. Lopresti, Z. Xue, L. R. Long, S. Antani, and G. Thoma, "A Classifier Ensemble based on Performance Level Estimation," In *Proc. of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 342-345, 2009. (Oral presentation)
- Y. Zhu, T. Shen, D. Lopresti, and X. Huang, "Interactive Polygons in Region-based Deformable Contours for Medical Images," In *Proc. of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 37-40, 2009.
- W. Wang, X. Huang, "Distance Guided Selection of the Best Base Classifier in an Ensemble with Application to Cervigram Image Segmentation," In *Proc. Of the IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis* (MMBIA), pp. 109-116, Miami FL, 2009.
- Y. Artan, X. Huang, "Combining Multiple 2ν -SVM Classifiers for Tissue Segmentation," In *Proc. of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 488-491, 2008. (Oral presentation)
- Y. Zhu, X. Huang, D. Lopresti, L. R. Long, S. Antani, Z. Xue, and G. Thoma, "Web-Based Multi-Observer Segmentation Evaluation Tool," In *Proc. Of the 21st IEEE International Symposium on Computer-Based Medical Systems* (CBMS), pp. 167-169, 2008.
- K. Okada, X. Huang, "Robust Click-Point Linking: Matching Visually Dissimilar Local Regions," In *Proc. Of IEEE International Workshop on Beyond Multiview Geometry: Robust Estimation and Organization of Shapes from Multiple Cues*, pp.1-8, 2007.
- J. Huang, X. Huang, D. Metaxas, and L. Axel, "Dynamic Texture based Heart Localization and Segmentation in 4-D Cardiac Images," In *Proc. of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro* (ISBI), pp. 852-855, 2007.
- J. Huang, X. Huang, D. Metaxas, and D. Banerjee, "3D Tumor Shape Reconstruction from 2D Bioluminescence Images," In *Proc. of the IEEE International Symposium on Biomedical Imaging:*

From Nano to Macro (ISBI), pp. 606-609, 2006. (Oral presentation)

H. Guan, T. Kubota, X. Huang, X. S. Zhou, M. Turk, "Automatic Hot Spot Detection and Segmentation in Whole Body FDG-PET Images," In *Proc. of the IEEE International Conf. on Image Processing* (ICIP), pp. 85-88, 2006.

K. Okada, X. Huang, X. Zhou, A. Krishnan, "Robust Click-Point Linking for Longitudinal Follow-Up Studies," In *Proc. of the 3rd International Workshop on Medical Imaging and Augmented Reality* (MIAR), pp. 252-260, 2006.

X. Huang, Z. Qian, R. Huang, and D. Metaxas, "Deformable-model based Textured Object Segmentation," In *Proc. of the 4th International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition* (EMMCVPR), LNCS-3757, pp. 119-135, 2005.

X. Huang, Y. Sun, D. Metaxas, F. Sauer, and C. Xu, "Hybrid Image Registration based on Configural Matching of Scale-Invariant Salient Region Features," In *Proc. of the 2nd IEEE Workshop on Image and Video Registration* (IVR), 2004.

X. Huang, S. Zhang, Y. Wang, D. Metaxas, and D. Samaras, "A Hierarchical Framework for High Resolution Facial Expression Tracking," In *Proc. of the 3rd IEEE Workshop on Articulated and Nonrigid Motion* (ANM), 2004.

C. Xu, X. Huang, A. Krishnan, and S. Samant, "An Automated Image-based Method for Multi-Leaf Collimator Positioning Verification in Intensity Modulated Radiation Therapy," In *Proc. of the International Conf. on Diagnostic Imaging and Analysis* (ICDIA), 2002.

Non-refereed and Invited Publications

E. Kim, S. Antani, X. Huang, L.R. Long, D. Demner-Fushman, "Using Relevant Regions in Image Search and Query Refinement for Medical CBIR," To appear in *Proc. of SPIE, Medical Imaging: Advanced PACS-based Imaging Informatics and Therapeutic Applications*, 2011. (Oral presentation)

E. Kim, X. Huang, G. Tan, L.R. Long, S. Antani, "A Hierarchical SVG Image Abstraction Layer for Medical Imaging," In *Proc. Of SPIE, Medical Imaging: Advanced PACS-based Imaging Informatics and Therapeutic Applications*, Vol. 7628, 2010. (Oral presentation)

S. Zhang, J. Huang, W. Wang, X. Huang, D. Metaxas, "Cervigram Image Segmentation based on Reconstructive Sparse Representations," In *Proc. Of SPIE, Medical Imaging: Image Processing*, Vol. 7623, 2010. (Oral presentation)

H. Li, T. Shen, M. B. Smith, I. Fujiwara, D. Vavylonis and X. Huang, "Automated Actin Filament Length Measurements in TIRFM Images Using Open Active Contours," Abstract in Biophysics Society 53rd Annual Meeting, Boston, 2009.

X. Huang, W. Wang, Z. Xue, S. Antani, L. R. Long, J. Jeronimo, "Cluster Features for Lesion Detection in Digital Cervigrams," In *Proc. Of SPIE, Medical Imaging: Image Processing*, Vol. 6914, 2008.

Y. Song, X. Huang, B. Mueller, and B. Mychalczak, "Phase Impact Factor: A Novel Parameter for Determining Optimal CT Phase in 4D Radiation Therapy Treatment Planning for Mobile Lung Cancer," In *Proc. Of SPIE, Medical Imaging: Visualization, Image-guided Procedures, and Modeling*, Vol. 6918, 2008. (Oral presentation)

W. Qu, X. Huang, Y. Jia, "Segmentation in Noisy Medical Images Using PCA Model Based Particle Filtering," In *Proc. Of SPIE, Medical Imaging: Image Processing*, Vol. 6914, 2008.

V. Potesil, X. Huang, X. S. Zhou, "Automated tumor delineation using joint PET/CT information," In *Proc. Of SPIE, Medical Imaging: Computer-aided Diagnosis*, Vol. 6514, 2007.

X. Huang, X. S. Zhou, A. Krishnan, "The efficacy of computer detection of kidney in PET/CT images and kidney SUV statistics in PET images," In *Radiological Society of North America Scientific*

Assembly and Annual Meeting (RSNA), 2006.

X. Huang, D. Metaxas, L. G. Menon, P. Mayer-Kuckuk, J. R. Bertino, and D. Banerjee, "Recovering 3D Tumor Locations from 2D Bioluminescence Images and Registration with CT Images," In *Proc. of SPIE, Biomedical Optics Conference: Multimodal Biomedical Imaging*, Vol. 6081, 2006.

Z. Qian, X. Huang, D. Metaxas, T. Chen, L. Axel, "Robust Segmentation of 4D Cardiac MRI-tagged Images via Spatio-temporal Propagation," In *Proc. Of SPIE, Medical Imaging: Physiology, Function and Structure from Medical Images*, Vol. 5746, pp. 580-591, 2005.

D. Metaxas, T. Chen, X. Huang, and L. Axel, "Cardiac Segmentation from MRI-Tagged and CT Images," In *Proc. of the 8th WSEAS International Conf. on Computers, special session on Imaging and Image Processing of Dynamic Processes in biology and medicine*, also in WSEAS Transactions on Computers, 2004.

HONORS AND AWARDS

- P.C. Rossin Assistant Professorship, Lehigh University, 2009
- Sigma Xi Scientific Research Honor Society Lehigh University Inductee, 2008
- Minority Junior Faculty Award for Career Enhancement, Christian R. and Mary F. Lindback Foundation, 2007
- Outstanding Reviewer Award at the IEEE International Conf. on Computer Vision (ICCV), 2007
- DIMACS Award for Student-initiated Research Projects, Rutgers University, 2002
- Tsinghua Excellent Student Scholarships, Tsinghua university, 1995,96,97,98

RESEARCH FUNDING

- "Web-based Image Annotation and Retrieval; Computer-assisted Technologies for Medical Image Segmentation and Pattern Recognition," National Institutes of Health, National Library of Medicine, PI, \$80,000, 9/01/2010 - 8/31/2011.
- "III-CXT-Small: Collaborative Research: Structuring, Reasoning, and Querying in a Very Large Medical Image Database," National Science Foundation, PI, (with D. Lopresti), \$229,519, 9/01/2008 - 8/31/2011.
- "Computational Analysis and Modeling of Contractile Ring Assembly," National Institutes of Health, National Institute of General Medical Sciences, PI, (with D. Vavylonis), \$385,515, 9/01/2008 - 8/31/2011.
- "Analysis of actin cytoskeleton structures using active contours," Biosystems Dynamics Summer Institute (BDSI), Howard Hughes Medical Institute and Lehigh University, PI, (with D. Vavylonis), \$30,000, 6/01/2010 - 8/01/2010.
- "Technologies for Computer-Assisted Biomedical Image Segmentation and Content-based Image Retrieval through Web Browsers," National Institutes of Health, National Library of Medicine, PI, \$65,000, 9/15/2009 - 9/14/2010.
- "Actin filament polymerization: modeling of elongation kinetics based on analysis of TIRFM images," Biosystems Dynamics Summer Institute (BDSI), Howard Hughes Medical Institute and Lehigh University, PI, (with D. Vavylonis), \$29,000, 6/01/2009 - 8/01/2009.
- "Network computing for biomedical image processing; cervigram segmentation," National Institutes of Health, National Library of Medicine, PI, \$55,000, 9/01/2008 - 08/31/2009.
- "Segmentation of Uterine Cervix Images by Support Vector Machine Methods," National Institutes of Health, National Library of Medicine, PI, \$24,900, 9/20/2007 - 9/19/2008.
- "Novel Methods and Applications for Chemical Image Analysis," Pennsylvania Infrastructure Technology Alliance, PI, (with R. Nagel), \$44,000, 3/01/2008 - 8/31/2009.
- "Novel Methods and Applications for Chemical Image Analysis," Air Products and Chemicals, Inc., PI, \$80,000, 9/01/2007 - 12/31/2010. Collaborators: A. Esmaili (Air Products and Chemicals, Inc.), R. Nagel (Lehigh CSE).
- "A Physically-based Heart Model for Segmentation, Motion Analysis and Disease Classification," Christian R. and Mary F. Lindback Foundation, PI, \$20,000, 6/01/2007 - 5/31/2008.

TEACHING AND RESEARCH ADVISING

Courses Taught, Computer Science and Engineering Dept., Lehigh University

- CSE-313: Computer Graphics, Fall 2006
- CSE-398/498: Image Analysis and Graphics, Spring 2007
- CSE-313: Computer Graphics, Fall 2007
- CSE-398/498: Image Analysis and Graphics, Spring 2008
- CSE-313: Computer Graphics, Fall 2008
- CSE-331: User Interface Systems and Techniques, Fall 2008
- CSE-319/419: Image Analysis and Graphics, Spring 2009
- CSE-313: Computer Graphics, Fall 2009
- CSE-397/497: Biomedical Image Computing and Modeling, Fall 2009
- CSE-319/419: Image Analysis and Graphics, Spring 2010
- CSE-319/419: Image Analysis and Graphics, Spring 2011

Research Advising

Doctoral Students

Wei Wang, 2006 - present
Yaoyao Zhu, 2007 - present (co-advising with Prof. D. Lopresti)
Tian Shen, 2007 - present
Hongsheng Li, 2008 - present
Edward Kim, 2008 - present
Ting Xu, 2009 - present

Undergraduate Research Advising

Doug Paul, 2006-2007 (research project)
Christopher Hamilton, 2007-2008 (senior project)
Samuel Wechsler, 2007-2008 (senior project)
Abraham Jun, 2008 (summer project)
Derrek Harrison, 2009 (senior project)
Alex Thompson, 2009 (senior project)
Eric Wasserman, 2009-2010 (senior project)
Whitney Levine, 2009-2010 (senior project)

Master's Students

Thomas Boinot, 2006-2007 (independent study)
Yusuf Artan, 2007-2008 (independent study)
Nick Moukhine, 2007 (independent study)
Hisham Abu-Nabaa, 2007 (independent study)
Yu Tian, 2008 (research project)
Mayura Warge, 2008-2009 (research project)

PATENTS

C. Xu, X. Huang, Y. Sun, and F. Sauer, "Method and System for Hybrid Rigid Registration based on Joint Correspondences between Scale-Invariant Salient Region Features," Patent issued as USP 7,362,920 on Apr. 22, 2008.

K. Okada, X. Huang, A. Krishnan, X. Zhou, "Robust Click-Point Linking with Geometric Configuration Context: Interactive Localized Registration Approach," Patent Pending, filed in Mar. 2007, U.S. Serial No. 11/705,375. Also filed in Germany and China.

X. Huang, X. Zhou, A. Jerebko, A. Krishnan, H. Guan, T. Kubota, V. Potesil, "System and Method for Whole Body Landmark Detection, Segmentation and Change Quantification in Digital Images," Patent pending, filed in Oct. 2006, U.S. Serial No. 11/542,477.

D. Metaxas, D. Banerjee, and X. Huang, "System and Method for Visualizing Three-dimensional Tumor Locations and Shape from Two-dimensional Bioluminescence Images," Patent pending, filed in Sept. 2005, U.S. Serial No. 60/715,610.

C. Xu, X. Huang, Y. Sun, "Fast Parametric Non-rigid Image Registration Based on Feature Correspondences," Patent pending, filed in Mar. 2005, U.S. Serial. No. 11/099,143.

C. Xu, X. Huang, Y. Sun, C. Ched'hotel, J. Guehring, F. Sauer, and S. Vogt, "Method and System for Fast Hybrid Rigid Registration of 2D/3D Medical Images," Patent pending, filed in Sept. 2004, U.S. Serial No. 10/946,204.

PROFESSIONAL SERVICES

- Session chair and program committee member for 2nd International Workshop on High-Performance Medical Image Computing for Image-Assisted Clinical Intervention and Decision-Making (HP-MICCAI), 2010
- Organizer (with D. Terzopoulos and G. Tsechpenakis) for "Deformable Models: Theory and Applications," A Special Track at 5th International Symposium on Visual Computing (ISVC), 2009
- Program committee member for IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR), 2007, 2008, 2009, 2010, 2011
- Program committee member for International Conf. on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2008, 2009, 2010
- Program committee member for IEEE International Conf. on Computer Vision (ICCV), 2007, 2009
- Program Committee member for International Symposium on Visual Computing (ISVC), 2009
- Program committee member for IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA), 2009
- Program committee member for International Conf. on Computer Vision Theory and Applications, 2008, 2010
- Program committee member for IEEE International Conf. on Advanced Video and Signal Based Surveillance (AVSS), 2008
- Reviewer for international conferences: Graphic Interface 2008, Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR) 2005, ICCV 2005, CVPR 2005 & 2006, MICCAI 2006 & 2007, ISBI 2008 & 2010, ICPR 2010, ECCV 2010, CBMS 2010, ACCV 2010, FIMH 2011, SIGGRAPH 2011, IJCAI 2011
- Reviewer for journals: IEEE Transactions on Pattern Analysis and Machine Intelligence, International Journal of Computer Vision, Medical Image Analysis, IEEE Transactions on Medical Imaging, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Image Processing, Computer Vision and Image Understanding, Image and Vision Computing, Pattern Recognition, Machine Vision and Applications, Graphical Models, Computer-aided Design, NeuroComputing
- Reviewer and panelist for proposals submitted to: NIHR NEAT (UK) 2008, NSF-IIS-Bio 2009, NSF-IIS-Robust Intelligence 2009, NSF-IIS-Human Centered Computing 2010

SCHOLARLY PRESENTATIONS AND INVITED TALKS

Invited seminars

- "Deformable Object Models for Segmentation and Matching," at Drexel University, Philadelphia, PA, Feb. 2011.
- "Nonrigid Shape Registration and Object Matching," at University of Pennsylvania, Philadelphia, PA, Dec. 2010.
- "Analysis of Actin Cytoskeleton using Active Contour and Active Surface Models," at Janelia Farm/HHMI Conference on "What Can Computer Vision Do for Neuroscience and Vice Versa?," Ashburn, VA, Nov. 2010.

- “Markup SVG - A Content Aware Image Abstraction for Online Image Annotation,” at Tsinghua University, Beijing, China, Sept. 2010.
- “Deformable Shape and Appearance Models for Segmentation and Registration,” at Siemens Corporate Technology, Beijing, China, Sept. 2010.
- “Object Models for Boundary Extraction with Application to Medical Image Analysis,” at Temple University, Philadelphia, PA, Sept. 2009.
- “Deformable Shape and Appearance Models for Segmentation and Registration,” at Tsinghua University, Beijing, China, Jun. 2009.
- “Computational Analysis of Cellular Images,” COT (Center for Optical Technologies) Workshop on Advanced Biophotonic Imaging Technologies at Lehigh University, Oct. 2008.
- “Extracting Quantitative Information from Pictorial Input,” Applied Statistical Sciences Roundtable Seminar at Air Products and Chemicals, Inc., Sept. 2008.
- “High Performance Computing in Biomedical Image Analysis and Visualization,” High Performance Computing Day at Lehigh University, Apr. 2008.
- “Free-form Deformable Shape and Appearance Models,” at Boston University, Boston, MA, Sept. 2007.
- “Free-form Deformable Shape and Appearance Models,” at City College and the Graduate Center, City University of New York, New York, NY, May 2007.
- “CISL: Cervical Image Segmentation by Learning from Ground Truth Database,” at National Library of Medicine, Bethesda, MD, Mar. 2007.
- “Using Implicit Shape Representation for Registration and Segmentation,” at Stevens Institute of Technology, Hoboken, NJ, Nov. 2006.
- “Free Form Deformable Models,” at Univ. of North Carolina - Chapel Hill, Chapel Hill, NC, Apr. 2006.
- “Free Form Deformable Models,” at Lehigh University, Bethlehem, PA, Mar. 2006.
- “Integrating Shape and Appearance for Deformable Modeling and Segmentation,” at Siemens Corporate Research, Princeton, NJ, Feb. 2005.
- “Integrating Shape and Appearance for Deformable Modeling and Segmentation,” at Siemens Medical Solutions, Malvern, PA, Mar. 2005.
- “Hybrid Image Registration using Salient Region Features,” at Siemens Corporate Research, Princeton, NJ, Jul. 2004.

Presentations at Selected Conferences/Workshops

- “Automated Actin Filament Segmentation, Tracking, and Tip Elongation Measurements based on Open Active Contour Models,” at IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI), Boston, Jul. 2009.
- “Simultaneous Image Transformation and Sparse Representation Recovery,” at IEEE International Conf. on Computer Vision and Pattern Recognition (CVPR), Anchorage, AK, Jun. 2008.
- “Cluster Features for Lesion Detection in Digital Cervigrams,” at SPIE Medical Imaging: Image Processing Conference, San Diego, CA, Feb. 2008.
- “Phase Impact Factor: A Novel Parameter for Determining Optimal CT Phase in 4D Radiation Therapy Treatment Planning for Mobile Lung Cancer,” at SPIE Medical Imaging Conference: Visualization, Image-guided Procedures, and Modeling, San Diego, CA, Feb. 2008.
- “Robust Click-point Linking: Matching Visually Dissimilar Local Regions,” at IEEE Workshop on Beyond Multiview Geometry (BMG), Minneapolis, MN, Jun. 2007.
- “Deformable Model based Textured Object Segmentation,” at Energy Minimization in Computer Vision and Pattern Recognition Workshop, St. Augustine, FL, Oct. 2005.
- “Metamorphs: Deformable Shape and Texture Models,” at IEEE International Conf. On Computer Vision and Pattern Recognition, Washington D.C., Jun. 2004.
- “Hybrid Image Registration based on Configurational Matching of Scale-invariant Salient Region Features,” at Second IEEE Workshop on Image and Video Registration, Washington D.C., Jun. 2004.

- “Establishing Local Correspondences towards Compact Representations of Anatomical Structures,” at Annual International Conf. on Medical Image Computing and Computer Assisted Intervention, Montreal, Canada, Nov. 2003.
- “Computing Layered Surface Representations: An Algorithm for Detecting and Separating Transparent Overlays,” at IEEE International Conf. on Computer Vision and Pattern Recognition, Madison, WI, Jun. 2003.