

# CURRICULUM VITAE

## WEIHONG GUO

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### EDUCATION

- Ph. D. in Applied Mathematics, University of Florida, Gainesville, Florida, May 2007  
Advisor: Professor Yunmei Chen  
**Dissertation: Medical image segmentation and diffusion weighted Magnetic Resonance Image analysis**
- Master in Statistics, University of Florida, Gainesville, Florida, May 2007  
**Thesis: A nonparametric model for simultaneous segmentation and adaptive denoising**
- B. S. in Computational Mathematics, Central University for Nationalities, Beijing, China, 1999  
**Thesis: An algorithm for automatic detection of contact cable of electric railway from digital images**

### RESEARCH INTERESTS

- Mathematical modeling and algorithm developing in medical image computing, image processing and computer vision
- Biomedical/molecular image analysis
- Compressive Sensing
- Partial differential equations and variational methods
- Computational neuroscience
- Statistical image processing and genetics data analysis

### APPOINTMENTS

- 08/2007 – Present Tenure track assistant professor, The University of Alabama, Tuscaloosa, AL
- 08/2005 – 05/2007 Graduate teaching assistant, University of Florida, Gainesville, FL
- 05/2005 – 08/2005 Intern, Siemens Corporate Research Inc., Princeton, NJ
- 08/2003 – 05/2004 Graduate teaching assistant, University of Florida, Gainesville, FL
- 09/2000 – 02/2001 Graduate teaching assistant, Beijing Normal University, Beijing, China
- 02/1999 – 06/1999 Intern, China Academy of Railway Science, Beijing, China

### PATENT

1. **Weihong Guo** and Zhizhou Wang, "*Fast Geometric Flow Based White Matter Fiber Tract Segmentation in DTI*", Patent pending, filed on 07/19/2006 as non-provisional patent, U.S. serial number: 11/489,103.

## RESEARCH PUBLICATIONS

### In refereed journals and conference proceedings :

*Conferences in my field are competitive with very limited acceptances (typically 15-35% overall, 5-8% for orals), where full papers (4-12 pages) undergo double-blind review processes.*

1. **W. Guo**, F. Huang, "A Local Mutual Information Guided Denoising Technique and Its Application to Self-calibrated Partially Parallel Imaging, D. Metaxas et al. (Eds): proceedings of Medical Image Computing and Computer Assisted Intervention, 2008, Part II, Lecture notes on Computer Science 5242, pp. 937-947.
2. **W. Guo**, Y. Chen, Q. Zeng, "A Geometric Flow Based Approach for Diffusion Tensor Image Segmentation", special issue on Mathematical and Statistical Methods for Diagnoses and Therapies, Journal of Philosophical Transaction A: Mathematical, Physical and Engineering Sciences, 2008, 366(1874):2279-92. Invited cover paper.
3. **W. Guo**, F. Huang, "Local Mutual Information Guided Denoising for Self-calibrated PPI" Proceedings of the Sixteenth Scientific Meeting and Exhibition of the ISMRM, 2008, pp.1289.
4. Y. Chen, **W. Guo**, Q. Zeng, Y. Liu, "A Nonstandard Smoothing in Reconstruction of Apparent Diffusion Coefficient Profiles from Diffusion Weighted Images", Journal of Inverse Problems and Imaging (IPI), Volume 2, Number 2, 2008, pp. 205-224.
5. **W. Guo**, F. Huang, "On the Improvement of Total Variation Regularization: the Framework and its Application on Image Enhancement for Partially Parallel Imaging", submitted to Magnetic Resonance in Medicine, 2008.
6. **W. Guo**, Joe Zhou, Y. Liu, "Multi-fiber Diffusion Anisotropy Research for DT-MRI Dataset", in revision, submitted to Space Medicine and Medical Engineering, 2008.
7. **W. Guo**, Tianyu Tang, Joe Zhou et al., "Multi-fiber diffusion anisotropy analysis in autism: a study based on MR diffusion-weighted images", submitted to Journal of Human Brain Mapping, 2008.
8. **W. Guo**, F. Huang, "Reconstruction combination and its application for PPI", CSMRM, 2008, to appear.
9. **W. Guo**, "Medical Image Segmentation and Diffusion Weighted Magnetic Resonance Image Analysis", dissertation, 2007.
10. **W. Guo**, Y. Chen, "Using Non-parametric Kernel to Segment and Smooth Images Simultaneously" Proceedings of International Conference on Image Processing (ICIP), 2006, pp.217-220.
11. **W. Guo**, Q. Zeng, Y. Chen, Y. Liu "Reconstruct White Matter Fiber Traces Using Multi-Tensor Deflection in DWI", Proceedings of International Symposium on Biomedical Image (ISBI), 2006, pp.69-72, also presented in SIAM'06 Conference on Imaging Science.
12. Y. Chen, **W. Guo**, Q. Zeng, X. Yan, Y. Liu "Apparent Diffusion Coefficient Approximation and Diffusion Anisotropy Characterization in DWI", Proceedings of International Conference on Information Processing in Medical Imaging (IPMI), 2005, pp.246-257. (**Acceptance rate < 26%**).
13. Q. Zeng, **W. Guo**, Y. Chen, Y. Liu "White Matter Fiber Tracking Based on Multi-Directional Vector Field" Proceedings of the Thirteenth Scientific Meeting and Exhibition of the ISMRM, 2005, pp.218.
14. Q. Zeng, **W. Guo**, Y. Chen, Y. Liu "White Matter Fiber Tracking Based on Multi-Directional Vector Field" 11th Annual Scientific Meeting of the Organization of Human Brain Mapping, Toronto, Canada, 2005, pp.1649.
15. Y. Chen, **W. Guo**, Q. Zeng, X. Yan, F. Huang, H. Zhang, G. He, B.C. Vemuri, Y. Liu "Estimation, Smoothing and Characterization of Apparent Diffusion Coefficient Profiles from High Angular Resolution DWI" Proceedings of IEEE computer society conf. on Computer Vision and Pattern Recognition (CVPR), 2004, pp. 588-593. (**Acceptance rate < 6.5%**).
16. Y. Chen, **W. Guo**, Q. Zeng, B.C. Vemuri, Y. Liu "Recovery of Intra-Voxel Structure from HARD

- DWI*" Proceedings of IEEE International Symposium on Biomedical Imaging (ISBI), 2004, pp.1028-1031.
17. Y. Chen, **W. Guo**, Q. Zeng, Y. Liu "*Classification of Intra-Voxel Diffusion from HARD MRI*" Proceedings of the Twelfth Scientific Meeting and Exhibition of the ISMRM, 2004, pp.252.
  18. Y. Chen, **W. Guo**, F. Huang, D. Wilson, A. Geiser "*Using Prior Shape and Points in Medical Image Segmentation*", Lecture Notes in Computer Science, Proceedings of International Workshop on Energy Minimization Methods in Computer Vision and Patter Recognition (EMMCVPR), 2003, pp.291-305.

### **In books:**

1. Q. Zeng, Y. Chen, **W. Guo**, Y. Liu, "*Recover Multi-tensor Structure from HARD MRI under Bi-Gaussian Assumption*", Multiscale Optimization Methods and Applications, 2005, pp.379-386, ISBN 0387295496, Springer.

### **Technical reports:**

1. **W. Guo**, F. Huang, "*A Local Mutual Information Guided Denoising Technique and Its Application to Self-calibrated Partially Parallel Imaging*", UCLA computational and applied mathematics technical report, 08-48, 2008.
2. Y. Chen, **W. Guo**, "*A Local Nonparametric Model for Simultaneous Image Segmentation and Adaptive Smooth*" UCLA computational and applied mathematics technical report, 07-34, 2007.
3. **W. Guo**, Z Wang, "*Fast Geometric Flows Based White Matter Fiber Tract Segmentation in DT-MRI*", Siemens Corporate Research intern report, August 2005.

### **RESEARCH FUNDING**

- Invivo Corporation, a subsidiary company of Phillips Medical Systems on MRI
- The University of Alabama start-up funding.
- The University of Alabama Research grant.

### **AWARDS/HONORS**

- Aug.2001-Aug.2005 University of Florida Alumni Fellowship
- Sep. 2008-Sep. 2009 The University of Alabama college of Art and Science, Department of Mathematics travel award
- Jan. 2008, UCLA IPAM travel award (supported by NSF) to attend workshop "Image Analysis Challenges in Molecular Microscopy. January 28 - February 1, 2008"
- June 2004 IEEE International Conference on Computer Vision and Pattern Recognition Student Travel Award, travel award from college, department and graduate student council.
- Sept.1995-July1999 Central University for Nationalities Excellent Student Scholarship
- 1999 Privilege to enter the Graduate Program at Beijing Normal University, waived of the admission test
- 1998 Second Prize, National College Student Mathematical Contest in Modeling, Beijing

### **MEMBERSHIPS**

- Society of Industry and Applied Mathematics (SIAM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Medical Image Computing and Computer Assisted Intervention (MICCAI)

## PROFESSIONAL SERVICES

- Referee for  
**SIAM journal on Scientific Computing**  
**International Conference on Scale Space and PDE Methods in Computer Vision;**  
**International Workshop on Energy Minimization Methods in Computer Vision and Patter Recognition;**  
**International Conference on Control, Automation, Robotics and Vision**
- Co-organizer of SIAM student workshop, March 3-4, 2004.
- Funding member of SIAM Gator Chapter
- Treasure of SIAM Gator Chapter 2004

## DEPARTMENTAL AND UNIVERSITY SERVICE

- Advisor of Ph.D. student Sadeq O Damrah in University of Alabama, Department of Mathematics
- Committee member of Ph.D. student Rami Al-Ahmad in University of Alabama at Birmingham, Department of mathematics
- Committee member of Ph.D. student Chuan Li in University of Alabama, Department of Electrical Engineering

## TEACHING EXPERIENCES

- Fall 2008, Mathematical Statistics, 8 graduate students
- Fall 2008, Spring 2008 Calculus I, 32 students
- Spring 2008, Numerical linear algebra, 18 graduate and 16 undergraduate students
- Fall 2007, Honors Calculus I, 32 students
- Spring 2006, Analytic Geometry and Calculus II, 33 students
- Fall 2005, instructor of Analytic Geometry and Calculus III, 25 students
- Spring 2004, Discussion leader of Analytic Geometry and Calculus I
- Fall 2003, Discussion leader of Precalculus
- Fall 2000, Discussion leader of Biostatistics

## SCHOLAR PRESENTATIONS AND INVITED TALKS

1. *"A Local Mutual Information Guided Denoising Technique and Its Application to Self-calibrated Partially Parallel Imaging"*, at International Conference on Medical Image Computing and Computer Assisted Intervention, New York City, NY, September, 2008.
2. *"On the improvement of Total Variation Regularization and Its Application on Partially Parallel Imaging"* at Society of Industry and Applied Mathematics Imaging Science conference, San Diego, CA, July, 2008.
3. *"Local Mutual Information Guided Image Enhancement"* at Mathematics Department of the University of Alabama at Birmingham, Birmingham, AL, April, 2008.
4. *"LMI-denoiser: A Local Mutual Information Guided Denoising Technique for Self-calibrated Partially Parallel Imaging"* at Mathematics Department of the University of Alabama Tuscaloosa, AL, December 2007.

5. *"Statistical methods for image registration and segmentation"* at Mechanics Engineering department of the University of Alabama at Birmingham, Birmingham, AL, October 2007.
6. *"A Nonparametric Scheme for Simultaneous Image Segmentation and Smoothing"* at University of Alabama System Joint Applied Mathematics 2007 Annual Meeting, Tuscaloosa, AL, October 2007.
7. *"Using Non-parametric Kernel to Segment and Smooth Images Simultaneously"* at International Conference on Image Processing, Atlanta, Georgia, November 2006.
8. *"Reconstruct White Matter Fiber Traces Using Multi-Tensor Deflection in DWI"*, at International Symposium on Biomedical Image, Arlington, Virginia, April 2006.
9. *"Estimation, Smoothing and Characterization of Apparent Diffusion Coefficient Profiles from High Angular Resolution DWI"* at IEEE computer society conference on Computer Vision and Pattern Recognition, Washington D. C. June 2006.
10. *"Apparent Diffusion Coefficient Approximation and Diffusion Anisotropy Characterization in DWI"*, at International Conference on Information Processing in Medical Imaging, Glenwood Springs, Colorado, July 2005.
11. *"Recovery of Intra-Voxel Structure from HARD DWI"*, at IEEE International Symposium on Biomedical Imaging, Arlington, Virginia, April 2004.
12. *"Recover Multi-tensor Structure from HARD MRI under Bi-Gaussian Assumption"*, SIAM student workshop, Gainesville, FL, March 2004.