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CONTACT
INFORMATION

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EDUCATION

University of North Carolina, Chapel Hill, North Carolina
 Ph.D. in Computer Science, May 2007.
 Dissertation: *An MRI Segmentation Framework for Brains with Anatomical Deviations.*

Purdue University, West Lafayette, Indiana
 B.S. in Computer Science and Mathematics (with highest distinction), August 2001.

RESEARCH
INTERESTS

Medical image analysis (image segmentation, validation of segmentations, simulation of biological changes, longitudinal analysis), computer vision, machine learning (pattern recognition), and scientific visualization.

RESEARCH
EXPERIENCE

University of Utah, Salt Lake City, Utah
Research Assistant Professor, School of Computing *July 2007 - present*
Research Scientist, Scientific Computing and Imaging Institute *July 2007 - present*
 Conducting research on the longitudinal analysis of multimodal structural and diffusion MR images.
 - Developing methods for analyzing longitudinal functional data (curves) by extracting meaningful changes in time.
 - Developing a framework for constructing brain atlases using combined geometric and image intensity features.

University of North Carolina, Chapel Hill, North Carolina
Postdoctoral Researcher, Department of Computer Science *January 2007 - June 2007*
 Conducted research on automatic segmentation of lesions in brain MRI, particularly those related to Multiple Sclerosis (MS) and lupus.

University of North Carolina, Chapel Hill, North Carolina
Research Assistant, Department of Computer Science *May 2002 - December 2006*
 Conducted research on automatic brain segmentation from Magnetic Resonance images.
 - Developed atlas-based methods for automatic segmentation of adult brains with tumor and neonatal infant brains.
 - Developed a system for simulation of tumor mass effect and edema infiltration in a healthy subject MRI to provide ground truth for validation of segmentation results.

Siemens Corporate Research, Princeton, New Jersey

Intern, Imaging and Visualization Department

May 2006 - August 2006

Research and development of automatic and semi-automatic brain MRI segmentation tools within the neuroimaging group.

- Developed a robust and efficient tool for automatic annotation of brain MRI. The software divides the brain into 63 anatomical regions in minutes.
- Developed a gesture based graphical interface for editing 3D binary segmentations.

University of North Carolina, Chapel Hill, North Carolina

Research Assistant, Department of Computer Science

August 2001 - May 2002

Conducted research on visualization of errors in tracking and motion capture devices.

TEACHING
EXPERIENCE

University of Utah, Salt Lake City, Utah

Seminar Coordinator, School of Computing

August 2008 - present

Coordinated invited presentations for the Scientific Computing and Imaging seminar series.

University of North Carolina, Chapel Hill, North Carolina

Instructor, Department of Computer Science

August 2005 - December 2005

Taught an undergraduate introductory programming course using Java. Fully responsible for lectures, assignments, examinations, and grading.

Purdue University, West Lafayette, Indiana

Teaching Assistant, Department of Computer Science

June 2000 - August 2000

Held regular laboratory hours for students in an introductory programming course using Java.

Purdue University, West Lafayette, Indiana

Teaching Assistant, Department of Mathematics

August 1999 - December 1999

Graded assignments and held regular office hours for students in freshmen level mathematics courses (algebra, trigonometry, and calculus).

SERVICE

Reviewer for the following journals:

- IEEE Transactions on Medical Imaging,
- Medical Image Analysis,
- NeuroImage,

and also for:

- Annals of Biomedical Engineering,
- Human Brain Mapping,
- IEEE Transactions on Biomedical Engineering,
- International Journal of Computer Assisted Radiology and Surgery,
- International Journal of Computer Mathematics,
- International Journal of Computer Vision,
- Journal of Mathematical Imaging and Vision,
- Pediatric Research.

SERVICE
(CONTINUED)

Reviewer for the MICCAI (Medical Image Computing and Computer Assisted Intervention) conference series.

Program committee member for the following workshops:

- Medical Image Analysis on Multiple Sclerosis (MIAMS); MICCAI 2008, 2009.
- Probabilistic Models for Medical Image Analysis (PMMIA); MICCAI 2009.

Grant proposal reviewer for Technology Foundation STW (Dutch government funding agency).

INVITED TALKS

“Image Analysis for Multiple Sclerosis Research”, The Brain Institute at the University of Utah, December 2008.

“Statistical and Physical Models for Generating a Brain Tumor MR Image Validation Database”, Mathematical Biosciences Institute at the Ohio State University, June 2008.

AWARDS AND
HONORS

- Golden Key International Honor Society.
- Phi Beta Kappa.
- Phi Kappa Phi.
- Upsilon Pi Epsilon.

PUBLICATIONS

ARTICLES IN JOURNALS

1. M. Prastawa, E. Bullitt, and G. Gerig. Simulation of Brain Tumors in MR Images for Evaluation of Segmentation Efficacy. *Medical Image Analysis (MedIA)*. Volume 13, Number 2, April 2009, pages 297-311.
2. J. H. Gilmore, W. Lin, M. Prastawa, C. B. Looney, Y. S. K. Vetsa, R. C. Knickmeyer, D. Evans, J. K. Smith, R. M. Hamer, J. A. Lieberman, and G. Gerig. Regional Gray Matter Growth, Sexual Dimorphism and Cerebral Asymmetry in the Neonatal Brain. *Journal of Neuroscience*. Volume 27, Number 6, February 2007, pages 1255-1260.
3. M. Prastawa, J. H. Gilmore, W. Lin, and G. Gerig. Automatic Segmentation of MR Images of the Developing Newborn Brain. *Medical Image Analysis (MedIA)*, Volume 9, Issue 5, October 2005, pages 457-466.
4. P. Lorenzen, M. Prastawa, B. Davis, G. Gerig, E. Bullitt, and S. Joshi. Multi-Modal Image Set Registration and Atlas Formation. *Medical Image Analysis (MedIA)*, Volume 10, Issue 3, June 2006, pages 440-451.
5. M. Prastawa, E. Bullitt, S. Ho, and G. Gerig. A Brain Tumor Segmentation Framework Based on Outlier Detection. *Medical Image Analysis (MedIA)*, Volume 8, Issue 3, September 2004, pages 275-283.
6. M. Prastawa, E. Bullitt, N. Moon, K. van Leemput, and G. Gerig. Automatic Brain Tumor Segmentation by Subject Specific Modification of Atlas Priors. *Academic Radiology*, Volume 10, Issue 12, December 2003, pages 1341-1348.

ARTICLES IN CONFERENCE AND WORKSHOP PROCEEDINGS

1. S. Gouttard, M. Prastawa, E. Bullitt, W. Lin, C. Goodlett and G. Gerig. Constrained Data Decomposition and Regression for Analyzing Healthy Aging from Fiber Tract Diffusion Properties. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2009*, to appear (Oral).

2. M. Prastawa and G. Gerig. Brain Lesion Segmentation through Physical Model Estimation. *International Symposium on Visual Computing (ISVC) 2008*. Lecture Notes in Computer Science (LNCS) 5358, pages 562-571 (Oral).
3. A. Fedorov, E. Billet, M. Prastawa, A. Radmanesh, G. Gerig, R. Kikinis, S. K. Warfield, and N. Chrisochoides. Evaluation of Brain MRI Alignment with the Robust Hausdorff Distance Measures. *International Symposium on Visual Computing (ISVC) 2008*. Lecture Notes in Computer Science (LNCS) 5358, pages 594-603 (Oral).
4. M. Prastawa and G. Gerig. Automatic MS Lesion Segmentation by Outlier Detection and Information Theoretic Region Partitioning. 3D Segmentation in the Clinic: A Grand Challenge II Workshop at *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2008*. Midas Journal: <http://hdl.handle.net/10380/1457> (Poster).
5. S. Gouttard, M. Styner, M. Prastawa, W. Lin, J. H. Gilmore, and G. Gerig. Assessment of Reliability of Multi-site Neuroimaging via Traveling Phantom Study. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2008*, Lecture Notes in Computer Science (LNCS) 5242, pages 263-270 (Poster).
6. M. Prastawa, E. Bullitt, and G. Gerig. Synthetic Ground Truth for Validation of Brain Tumor MRI Segmentation. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2005*, Lecture Notes in Computer Science (LNCS) 3749, pages 26-33 (Oral).
7. B. Mortamet, D. Zeng, G. Gerig, M. Prastawa, and E. Bullitt. Effects of Healthy Aging Measured By Intracranial Compartment Volumes Using a Designed MR Brain Database. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2005*, Lecture Notes in Computer Science (LNCS) 3749, pages 383-391 (Poster).
8. M. Prastawa, J. Gilmore, W. Lin, and G. Gerig. Automatic Segmentation of Neonatal Brain MRI. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2004*, Lecture Notes in Computer Science (LNCS) 3216, pages 10-17 (Oral).
9. M. Prastawa, E. Bullitt, S. Ho, and G. Gerig. Robust Estimation for Brain Tumor Segmentation. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2003*, Lecture Notes in Computer Science (LNCS) 2879, pages 530-537 (Oral).

ABSTRACTS AND SHORT PAPERS

1. M. Benders, J. Dubois, F. Lazeyras, S. Warfield, M. Styner, M. Prastawa, and P. Huppi. Brain Development Evaluated by Two Different MR Imaging Segmentation Techniques in Preterm Neonates. *Pediatric Academic Societies' (PAS) Annual Meeting*, May 2007.
2. G. Gerig, P. Fillard, M. Prastawa, W. Lin, and J. H. Gilmore. Neonatal Brain Development Assessed by New Quantitative Analysis of High-field 3Tesla MRI and DTI. *Society of Biological Psychiatry (SOBP)*, April 2004.
3. G. Gerig, M. Prastawa, W. Lin, and J. Gilmore. Assessing Early Brain Development in Neonates by Segmentation of High-Resolution 3T MRI. *Medical Image Computing and Computer Assisted Intervention (MICCAI) 2003*, Lecture Notes in Computer Science (LNCS) 2879, pages 979-980.
4. G. Gerig, P. Fillard, M. Prastawa, W. Lin and J. Gilmore. New Quantitative Analysis of High-field 3T MRI/DTI to Assess Neonatal Brain Development. *American College of Neuropsychopharmacology (ACNP)*, December 2003.