



## Short Bios

Guido Gerig is Taylor Grandy professor with a joint appointment in the Department of Computer Science and in the Department of Psychiatry at the University of North Carolina at Chapel Hill. He received his Ph.D. in 1987 from the Swiss Federal Institute of Technology, ETH Zurich, Switzerland. Guido Gerig joined the faculty at UNC-Chapel Hill in August 1998.

Guido Gerig began research in the area of medical image analysis in 1985 at ETH Zurich, Switzerland. Since then, he has led a large number of national and international projects with close multidisciplinary collaboration between medicine, engineering, statistics, industry, and computer science. He has spent several research leaves as a visiting assistant professor at the Brigham and Women's Hospital at Harvard Medical School. Guido Gerig is a member of the editorial board of the journal *Medical Image Analysis*, published by Elsevier. He has served on the committees of a number of computer vision and image analysis conferences and workshops. He is the director of the UNC Neuroimage Analysis Laboratory and supports a number of clinical neuroimaging projects with methodology for image processing, registration, atlas building, segmentation, shape analysis, and statistical analysis. Current key research topics are segmentation of MRI/DTI of the early developing brain, longitudinal analysis of multi-shape complexes, building of population atlases of volumetric images and embedded shapes, and new methodologies for statistical analysis of diffusion tensor imaging (DTI). Tools and methods developed through driving clinical applications are open source (ITK) and made available to public.

## Professional Activities and Affiliations

- Editorial Board (Executive Committee) MEDICAL IMAGE ANALYSIS Journal, published by Elsevier B.V.
- Board Member Medical Image Computing and Computer Assisted Intervention MICCAI
- Member MICCAI Society
- Senior Member IEEE
- Guest Editor Academic Radiology Dec. 2003
- NIH Study Sections: BISTI, HBR, SBIRs, P41
- Reviewer IEEE TMI, NeuroImage, MedIA, IJCV
- Reviewer Conferences: MICCAI, IPMI, MMBIA, SIGGRAPH, CVPR etc.

## Awards and Honors

- 2006: Dept. of Computer Science UNC: Student Teaching Award
- 2004: Dept. of Computer Science UNC: Student Teaching Award
- 1999: Dept. of Computer Science UNC: Student Teaching Award
- 1988: DAGM-Prize, 10. DAGM-Symposium Zurich, Sept. 1988, Prize for the best student paper at the DAGM'88 conference titled "Recognition of Nonrigid Objects Using the Generalized Hough Transform", by D. Morgue and G. Gerig
- 1987 Brown Boveri Company (BBC) Research Award 1987 for the Ph.D dissertation thesis "Segmentierung zur symbolischen Beschreibung von Grauwertbildern" (Segmentation for symbolic description of gray level images)

**PhD  
advising**

- **Marcel Prastawa (PhD expected 2006)**
- **Timothy Terriberly (PhD expected 2006)**
- **Christine Xu**
- **Ipek Oguz**
- **Casey Goodlett**
- Sean Ho (PhD UNC Oct. 2004)
- Martin Styner (PhD UNC July 2001)
- Daniel Welti (PhD ETHZ March 2001)
- Martin Berger (PhD ETHZ 1999)
- Andras Kelemen (PhD ETHZ 1998)
- Dimitri Ekatothramis (PhD ETHZ 1998)
- Christian Brechbuehler (PhD ETHZ 1996)

currently member of 9 other PhD committees

**Graduate /  
MS student  
advising**

- **Kevin Gorczowski**
- **Bradley Moore**
- Sampath Vetsa (MS Spring 2003)
- Megan Dunican (MS Spring 2003)
- Nathan Moon (MS Spring 2002)

**Neuro-  
imaging  
Laboratory**

**Director of UNC Neuroimaging Laboratory with currently 16 personnel, trainees and supervisees:**

- Isabelle Corouge (Postdoctoral researcher)
- Joseph Blocher (Director of clinical imaging studies)
- Robert McClure (M.D., Psychiatrist)
- Gary Long (systems manager)
- Sampath Vetsa (programmer/researcher)
- Sylvain Gouttard (programmer/researcher)
- Matthieu Jomier (programmer/researcher)
- Meaghan Casey (technical assistant)
- Chris Looney (medical student)
- Rebecca Knickmeyer (medical student)
- Lisa Fagan (M.D, residency with research rotations)
- Heather Cody (Psychiatry Ass. Prof.)
- Rachel Gimpel (technical assistant)
- Delphine Ribes (guest researcher)
- Mickael Meyer (guest researcher)
- Remi Jean (guest researcher)

plus over 5 part time lab users and organization of Autism Center satellite laboratory

**Grant  
Funding**

**Current:**

- U54 NIH Roadmap for Medical Research: NAMIC: National Alliance for Medical Imag Computing (PI Ron Kikinis, Role Guido Gerig: Co-investigator Core 1)
- P50 NIH Silvio Conte Research Center (PI John Gilmore, Role G. Gerig: PI Neuroimaging Core)
- P01 NIBIB-NCR: Medical Image Presentation MIP (PI S.M. Pizer, Role G. Gerig: PI Project 3: Shape in Schizophrenia)
- P30 NICHD: UNC Neurodevelopmental Disorders Research Center NDRC: Child Development and Mental Retardation (Role G. Gerig: Co-director Neuroimaging)
- NAAR (National Alliance of Autism Research): Quantitative white matter analysis of early brain development in Autism: New methods to assess differences in developmental trajectories of fiber tracts (PI G. Gerig)
- Eli Lilly: Demonstration of drug effect (PI G. Gerig)
- Co-investigator in 5 other NIH funded P01s and R01s

**Past:** (only major multi-site grants listed):

- European Community & Swiss BBW, 4th framework: BIOMED 2, #95084, Title: BIOMORPH", 6 European academic and clinical partners (1996-98)
- European Community AIM #A2003 & Swiss KWF, Advanced Informatics in Medicine: COVIRA: Computer Vision in Radiology, 17 partners (3 industrial, 8 academic, 6 clinical), (9192-95)
- European Community, ESPRIT & Swiss NSF, # BBW E 3300 Geometry-Driven Diffusion in Vision", 7 European and 5 US academic partners (1993-96)

## Publications

### Articles in Journals

1. Carissa J. Cascio, **Guido Gerig**, Joseph Piven, Diffusion Tensor Imaging: Application to the Study of the Developing Brain, in print Journal of the American Academy of Child and Adolescent Psychiatry JAACAP, in print, to appear August 2006
2. Isabelle Corouge, P.Thomas Fletcher, Sarang Joshi, Sylvain Gouttard, **Guido Gerig**, Fiber Tract-Oriented Statistics for Quantitative Diffusion Tensor MRI Analysis, Med Image Anal. 2006 Oct;10(5):786-98. Epub 2006 Aug 22. PMID: 16926104
3. Carissa J. Cascio, Martin Styner, Rachel G. Smith, Michele D. Poe, **Guido Gerig**, Heather C. Hazlett, Matthieu Jomier, Roland Bammer, and Joseph Piven, Tractography-based segmentation of the corpus callosum reveals a reduced relationship to cortical white matter volume in young children with developmental delay, in print Amer. Journal of Psychiatry AJR
4. Yushkevich, PA, Piven, J., Cody Hazlett, H., Gimpel Smith, R., Ho, S, Gee, J.J., **Gerig, G.**; User-Guided 3D Active Contour Segmentation of Anatomical Structures: Significantly Improved Efficiency and Reliability. Neuroimage. 2006 Jul 1;31(3):1116-28. Epub 2006 Mar 20. PMID: 16545965
5. Peter Lorenzen, Marcel Prastawa, Brad Davis, **Guido Gerig**, Elizabeth Bullitt, and Sarang Joshi, Multi-Modal Image Set Registration and Atlas Formation, Med Image Anal. 2006 Jun;10(3):440-51. PMID: 15919231
6. Heather Cody Hazlett, Michele D. Poe, **Guido Gerig**, Rachel Gimpel Smith and Joseph Piven, Cortical Gray and White Brain Tissue Volume in Adolescents and Adults with Autism, Biol Psychiatry. 2006 Jan 1;59(1):1-6. Epub 2005 Sep 1. PMID: 16139816
7. Matthew J. Hoptman, Jan Volavka, Elisabeth M. Weiss, Pál Czobor, Philip R. Szeszko, **Guido Gerig**, Miranda Chakos, Joseph Blocher, Leslie L. Citrome , Jean-Pierre Lindenmayer, Brian Sheitman, Jeffrey A. Lieberman and Robert M. Bilder, Quantitative MRI Measures of Orbitofrontal Cortex in Patients with Chronic Schizophrenia or Schizoaffective Disorder, Psychiatry Res. 2005 Nov 30;140(2):133-45. Epub 2005 Oct 25. PMID: 16253482
8. Marcel Prastawa, John Gilmore, Weili Lin, and **Guido Gerig**. *Automatic Segmentation of MR Images of the Developing Newborn Brain*. Med Image Anal. 2005 Oct;9(5):457-66. PMID: 16019252
9. Amy Pinkham, David Penn, Bethany Wangelin, Diana Perkins, **Guido Gerig**, Hongbin Gu, and Jeffrey Lieberman, Facial Emotion Perception and Fusiform Gyrus Volume in First Episode Schizophrenia, Schizophr Res. 2005 Nov 15;79(2-3):341-3. Epub 2005 Aug 25. PMID: 16125902
10. Hazlett, Heather Cody, Poe, Michele, **Gerig, Guido**, Smith, Rachel, Provenzale, Jim, Ross, Allison, Gilmore, John H. and Piven, Joseph, An MRI and Head Circumference Study of Brain Size in Autism: Birth through age two years, Arch Gen Psychiatry. 2005 Dec;62(12):1366-76. PMID: 16330725
11. Elizabeth Bullitt, Donglin Zeng, **Guido Gerig**, Stephen Aylward, Sarang Joshi, J. Keith Smith, Weili Lin, Matthew G. Ewend, Vessel Tortuosity and Brain Tumor Malignancy: A Blinded Study, Acad Radiol. 2005 Oct;12(10):1232-40. PMID: 16179200
12. Martin Styner, Jeffrey A. Lieberman, Robert McClure, Daniel Weinberger, Douglas Jones, **Guido Gerig**, Morphometric analysis of lateral ventricles in schizophrenia and healthy controls regarding genetic and disease-specific factors, Proc Natl Acad Sci U S A. 2005 Mar 29;102(13):4872-7. Epub 2005 Mar 16. PMID: 15772166
13. Cevidanes LHS, Franco AA, **Gerig G**, Proffit. WR, Slice DE, Enlow DH, Vigorito JW, Lederman HM, Amorim, Assessment of mandibular growth and response to orthopedic

therapy with 3-dimensional magnetic resonance images. *Am J Orthod Dentofacial Orthop*, 128:16-26, 2005

14. Cevidanes LHS, Franco AA, **Gerig G**, Proffit. WR, Slice DE, Enlow DH, Vigorito JW, Yamashita HK, Kim, Y., Comparison of relative mandibular growth vectors with high-resolution 3-dimensional imaging. *Am J Orthod Dentofacial Orthop*, 128:27-34, 2005
15. Sarang Joshi, Brad Davis, Matthieu Jomier, **Guido Gerig**, "Unbiased Diffeomorphic Atlas Construction for Computational Anatomy", *Supplement issue on Mathematics in Brain Imaging*, (PM Thompson, MI Miller, T Ratnanather, RA Poldrack, and TE Nichols, eds.), vol. 23, no. Supplement1, pp. S151-S160, Elsevier, Inc, 2004.
16. M.H. Chakos, S.A. Schobel, G. **Gerig**, H. Gu, C. Charles, J. Lieberman, Clinical correlates of hippocampal volume in schizophrenia as assessed by 3D manual segmentation, *British Journal of Psychiatry*, vol. 186, no. , pp. 26-31, 2005.
17. Abnormal vessel tortuosity as a marker of treatment response of malignant gliomas: Preliminary report. Elizabeth Bullitt, Matthew G. Ewend, Stephen Aylward, Weili Lin, **Guido Gerig**, Sarang Joshi, Inkyung Jung, Keith Muller, Keith Smith, Technology in Cancer Research and Treatment TCRT, Volume 3, No. 6 (p 525-670) Dec 2004
18. Marcel Prastawa, Elizabeth Bullitt, Sean Ho, **Guido Gerig**, "A Brain Tumor Segmentation Framework Based On Outlier Detection", *Medical Image Analysis MEDIA*, Elsevier, Vol. 8, Issue 3, Sept. 2004, Pages 275-283
19. Martin Styner, Jeffrey A. Lieberman, and **Guido Gerig**, "Boundary and Medial Shape Analysis of the Hippocampus in Schizophrenia", *Medical Image Analysis MEDIA*, Elsevier, Vol. 8, Issue 3, Sept. 2004, Pages 197-203
20. John H. Gilmore, Guihua Zhai, Kathy Wilber, J. Keith Smith, Weili Lin, and **Guido Gerig**, "3T magnetic resonance imaging of the brain in newborns", *Psychiatric Research Neuroimaging* 132 (2004): 81-85
21. Prastawa M, Bullitt E, Moon N, van Leemput K, **Gerig G**. Automatic tumor segmentation by subject specific modification of atlas priors. *Acad Radiol*, 2003; 10(12):1341-1348.
22. Zhai, G., Lin, W., Wilber, K., **Gerig, G.**, and Gilmore, J., "Comparison of Regional White Matter Diffusion in Healthy Neonate and Adults Using a 3T Head-only MR Scanner", *Radiology*:229, 2003, pp. 673-681
23. Styner M, **Gerig F**, Lieberman J, Jones D, Weinberger D. Statistical shape analysis of neuroanatomical structures based on medial models. *Medical Image Analysis MEDIA* (Elsevier), 2003;7(3):207-220
24. Styner M, **Gerig G**, Pizer S, Joshi S. Automatic and robust computation of 3D medial models incorporating object variability. *International Journal of Computer Vision IJCV*, Vol. 55, No. 2/3, Nov/Dec 2003, pp. 107-122
25. Joshi S, Lorenzen P, **Gerig G**, Bullitt E. Structural and radiometric asymmetry in brain images. *Medical Image Analysis (MEDIA, Elsevier)*, 2003;7(2):155-170.
26. Stephen M. Pizer, Guido **Gerig**, Sarang Joshi, Stephen R. Aylward, Multiscale Medial Shape-Based Analysis of Image Objects, *Proceedings of the IEEE, Special Issue on: Emerging Med. Imag. Techn.*, 91 (10), October 2003
27. Bullitt, E., and **Gerig, G.**, and Pizer, S., and Lin, W. and Aylward, S. Automatic Measuring Tortuosity of the Intracerebral Vasculature from MRA Images, *IEEE Transactions on Medical Imaging TMI*, 22(9), 2003, pp. 1163-1171
28. Shenton ME, **Gerig G**, McCarley RW, Szekely G, Kikinis R. Amygdala-hippocampus shape differences in schizophrenia: The application of 3D shape models to volumetric MR data. *Psychiatry Res Neuroimaging*, 2002;115:15-35.
29. Gilmore JH, **Gerig G**, Specter B, Charles HC, Wilber JS, Hertzberg BS, Kliwer MA: Infant cerebral ventricle volume: a comparison of 3D ultrasound and magnetic resonance imaging. (Clinical Note). *Ultrasound Med Biol*, 2001;27(8):1143-6.

30. Bullitt E, Aylward S, Bernard E, **Gerig G**, Computer-assisted visualization of arteriovenous malformations on the home personal computer. *Neurosurgery*, 2001; 48(3):576-82.
31. **Gerig G**, Welti D, Guttman CR, Colchester CA, Székely G. Exploring the discrimination power of the time domain for segmentation and characterization of lesions in serial MR data. *MedIA*, 2000; 4(1):31-42.
32. Styner M, Brechbuehler C, Székely G, **Gerig G**, Parametric estimate of intensity inhomogeneities applied to MRI, *IEEE Trans Med Imaging*, 2000;19(3):153-65.
33. Kelemen A, Szekely G, **Gerig G**. Elastic Model-Based Segmentation of 3-D Neuroradiological Data Sets, *IEEE Trans Med Imaging (special issue on model-based segmentation)*, 1999; 18(10):828-39.
34. Sato Y, Nakajima S, Shiraga N, Atsumi H, Yoshida S, Koller T, **Gerig G**, Kikinis R. Three-dimensional multi-scale line filter for segmentation and visualization of curvilinear structures in medical images. *MEDIA*, 1998;2(2):143-68.
35. Szekely G, Kelemen A, Brechbuehler C, **Gerig G**. Segmentation of 3D objects from MRI volume data using constrained elastic deformations of flexible Fourier surface models. *Medical Imaging Analysis MedIA*, 1996;1(1):19-34 .
36. Brechbuehler Ch, **Gerig G**, Kuebler O. Parametrization of closed surfaces for 3-D shape description. *Computer Vision and Image Understanding (CVIU)*, 1995;61(2):154-70.
37. Kikinis R, Shenton ME, **Gerig G**, Hokama H, Haimson HJ, O'Donnell BF, Wible CG, McCarley RW, Jolesz FA, Temporal lobe sulco-gyral pattern anomalies in schizophrenia: an in vivo MR three-dimensional surface rendering study. *Neuroscience Lett*, 1994; 182(1):7-12.
38. Pun T, **Gerig G**, Ratib O. Image analysis and computer vision in medicine. *Comput Med Imaging Graph. Multimedia techniques in the medical environment*. 1994; 18(2):85-96.
39. Kikinis R, Shenton ME, **Gerig G**, Martin J, Anderson M, Metcalf D, Guttman CRG, McCarley RW, Lorensen B, Cline H, Jolesz FA. Routine quantitative analysis of brain and cerebrospinal fluid spaces with MR imaging. *J Magn Resonan Imaging*, 1992;2(6):619-29.
40. **Gerig G**, Martin J, Kikinis R, Kuebler O, Shenton M, Jolesz FA. Unsupervised tissue type segmentation of 3D dual-echo MR head data. *Image and Vision Computing*, 1992;10(6):349-60.
41. **Gerig G**, Kikinis R, Kuebler O, Jolesz FA. Nonlinear anisotropic filtering of MRI data. *IEEE Trans Med Imaging*, 1992;11(2):221-32.
42. **Gerig G**, Kikinis R, Kuoni W, von Schulthess GK, Kuebler O. Semiautomated ROI analysis in dynamic MRI-studies, Part I: Image analysis tools for automatic correction of organ displacements. *JCAT*, 1991;15(5):725-32.
43. von Schulthess GK, Kuoni W, **Gerig G**, Wuethrich R, Duetwell St., Krestin G. Semiautomated ROI analysis in dynamic MRI-studies, Part II: Appl. to Renal Function Examination, First Experiences. *JCAT*, 1991;15(5):733-41.
44. Cline HE, Lorensen WE, Souza St P, Jolesz FA, Kikinis R, **Gerig G**, Kennedy Th E. 3D surface rendered MR images of the brain and its vasculature. *JCAT*, 1991;15(2):344-51.

#### Conference and Workshop Proceedings (peer reviewed full length articles)

1. Martin Styner, Kevin Gorczowski, Tom Fletcher, Ja Yeon Jeong, Stephen M. Pizer, **Guido Gerig**, Multi-Object Statistics using Principal Geodesic Analysis in a Longitudinal Pediatric Study, Springer Lecture Notes in Computer Science LNCS No.

- 4091, G-Z Yang, T. Jiang, D. Shen, L. Gu and J. Yang, editors, Springer Verlag, Proc. MIAR conference, pp. 1 - 8, August 2006
2. Timothy B. Terriberry and **Guido Gerig**, A Continuous 3-D Medial Shape Model With Branching, Workshop on the Mathematical Foundations of Computational Anatomy MFCA-2006, in conjunction with MICCAI 2006
  3. Casey Goodlett, Brad Davis, Remi Jean, John Gilmore, and **Guido Gerig**, Improved Correspondence for DTI Population Studies via Unbiased Atlas Building, Springer LNCS, Vol. 4191, Proc. MICCAI, Oct. 2006, pp. 260 - 267
  4. Computational Anatomy to Assess Longitudinal Trajectory of Brain Growth, **G. Gerig**, B. Davis, P. Lorenzen, M. Jomier, J. Piven and S. Joshi, Proc. IEEE 3DPVT Conf., June 2006
  5. Martin Styner, Matthieu Jomier, and **Guido Gerig**, Closed and open source neuroimage analysis tools and libraries at UNC, in IEEE Int. Symposium on Biomedical Imaging (ISBI), special session Open Source, pp. 702-705, Apr. 2006.
  6. **Guido Gerig**, Sarang Joshi, Tom Fletcher, Kevin Gorczowski, Shun Xu, Stephen M. Pizer, Martin Styner, "Statistics of populations of images and its embedded objects: Driving applications in neuroimaging", in IEEE International Symposium on Biomedical Imaging (ISBI), special session Shape in Imaging, pp. 1120-1123, Apr. 2006
  7. Shun Xu, Martin Styner, Brad Davis, Sarang Joshi, **Guido Gerig**, Group Mean Differences of Voxel and Surface Objects via Nonlinear Averaging, in IEEE Int. Symposium on Biomedical Imaging (ISBI), pp. 758-761, Apr. 2006
  8. Corouge, I., Fletcher, T., Joshi, S., Gilmore J. and **Gerig, G.**, Fiber Tract-Oriented Statistics for Quantitative Diffusion Tensor MRI Analysis, Lecture Notes in Computer Science LNCS, James S. Duncan and Guido Gerig, editors, Springer Verlag, Vol. 3749, Oct. 2005, pp. 131 – 138
  9. Prastawa, M., Bullitt, E. and **Gerig, G.**, Synthetic Ground Truth for Validation of Brain Tumor MRI Segmentation, Lecture Notes in Computer Science LNCS, James S. Duncan and Guido Gerig, editors, Springer Verlag, Vol. 3749, Oct. 2005, pp. 26 -- 33
  10. Mortamet, B., Donglin, Z., **Gerig, G.**, Prastawa, M. and Bullitt, E., Effects of healthy aging measured by intracranial compartment volumes using designed MR brain database, Lecture Notes in Computer Science LNCS, James S. Duncan and Guido Gerig, editors, Springer Verlag, Vol. 3749, Oct. 2005, pp. 383 – 391
  11. Terriberry, Tim, Joshi Sarang, and **Gerig, Gerig**, Hypothesis Testing with Nonlinear Shape Models, Lecture Notes in Computer Science LNCS, Gary E. Christensen and Milan Sonka, editors, Springer, Vol. 3565, July. 2005, pp. 15 -- 26
  12. Elizabeth Bullitt, Inkyung Jung, Keith Muller, **Guido Gerig**, Stephen Aylward, Sarang Joshi, Keith Smith, Matthew Ewend, "Determining Malignancy of Brain Tumors By Analysis of Vessel Shape", Lecture Notes in Computer Science LNCS 3217, Springer Verlag, pp. 645-653, 2004
  13. Peter Lorenzen, Brad Davis, **Guido Gerig**, Elizabeth Bullitt and Sarang Joshi, "Multi-class Posterior Atlas Formation via Unbiased Kullback-Leibler Template Estimation", Lecture Notes in Computer Science LNCS 3216, Springer Verlag, pp. 95-102, 2004
  14. Sean Ho and **Guido Gerig**, "Profile Scale-spaces for Multiscale Image Match", Lecture Notes in Computer Science LNCS 3216, Springer Verlag, pp. 176-183, 2004
  15. Marcel Prastawa, John Gilmore, Weili Lin, and **Guido Gerig**, "Automatic Segmentation of Neonatal Brain MRI", Lecture Notes in Computer Science LNCS 3216, Springer Verlag, pp. 10-17, 2004
  16. Corouge, Isabelle, Gouttard, Sylvain and **Gerig, Guido**, "A Statistical Shape Model of Individual Fiber Tracts Extracted from Diffusion Tensor MRI", Lecture Notes in Comp. Sc. LNCS 3217, Springer Verlag, pp. 671-679, 2004

17. Corouge, Isabelle, Gouttard, Sylvain and **Gerig, Guido**, "Towards a Shape Model of White Matter Fiber Bundles using Diffusion Tensor MRI" , Int. Symp. on Biomedical Imaging (ISBI'04), (Piscataway, NJ), pp. 344-347, April 2004
18. Prastawa M, Bullitt E, **Gerig G**, Robust estimation for brain tumor segmentation, Lecture Notes in Computer Science LNCS #2879 Springer, November 2003, 530-537
19. Fillard P, Gilmore J, Lin W, **Gerig G**. Quantitative analysis of white matter fiber properties along geodesic paths. Lecture Notes in Computer Science LNCS #2879 Springer, Nov. 2003, pp. 16-23
20. **Gerig G**, Muller KE, Kistner EO, Chi Y-Y, Chakos M, Styner M, Lieberman JA. Age and treatment related local hippocampal changes in schizophrenia explained by a novel shape analysis method. Lecture Notes in Computer Science LNCS #2879, Springer, Nov. 2003, 653-660
21. Styner M, Lieberman JA, **Gerig G**. Boundary and medial shape analysis of the hippocampus in schizophrenia. Lecture Notes in Computer Science LNCS #2879, Springer, Nov. 2003, pp. 464-471
22. Sampath Y, Vetsa K, Styner M, Pizer SM, Lieberman JA, **Gerig G**. Caudate shape discrimination in schizophrenia using template-free nonparametric tests", Lecture Notes in Computer Science LNCS #2879, Nov. 2003, pp. 661-669
23. Bullitt E, **Gerig G**, Aylward S, Joshi S, Smith K, Ewend M, and Lin W. Vascular attributes and malignant brain tumors. Lecture Notes in Computer Science LNCS #2878, Springer, Nov. 2003, pp. 671-679
24. Nathan M, Bullitt E, van Leemput K, **Gerig G**. Automatic brain and tumor segmentation. Proc. MICCAI 2002, Dohi T, Kikinis R (eds.), Lecture Notes in Computer Science, Springer LNCS 2488, September 2002.
25. Moon M, Bullitt E, van Leemput K, **Gerig G**. Model-based brain and tumor segmentation. Proc. ICPR 2002, Aug.2002.
26. Ho S, Bullitt E, **Gerig G**. Level set evolution with region competition: Automatic 3-D segmentation of brain tumors. Proc. ICPR2002, Aug 2002.
27. Pizer SM, Fletcher T, Thall A, Styner M, **Gerig G**, Joshi S. Object models in multiscale intrinsic coordinates via M-reps. Proc. GMBV 2002 (Workshop: Generative Model-Based Vision), Fall 2002.
28. **Gerig G**, Styner M, J. Lieberman J. Shape versus Size: Improved understanding of the morphology of brain structures, Proc. MICCAI2001, Kluwer, October 2001.
29. **Gerig G**, Jomier M, Chakos M. VALMET: A new validation tool for assessing and improving 3D object segmentation, Proc. MICCAI 2001, Kluwer, October 2001.
30. Styner M, and **Gerig G**. Three-dimensional medial shape representation incorporating object variability, Proc. of CVPR 2001 conference, IEEE, Dec. 2001.
31. Styner M., and **Gerig, G.**, Medial models incorporating object variability for 3D shape analysis, Lecture Notes in Computer Science LNCS 2082, Springer, pp. 502-516, June 2001
32. Welti, D., **Gerig, G.**, Radue, E-W. Kappos, L. and Szekeley, G., Spatio-temporal Segmentation of Active Multiple Sclerosis Lesions in Serial MRI Data, Lecture Notes in Computer Science LNCS 2082, Springer, 438-445, June 2001
33. M. Styner and G. Gerig, Hybrid boundary-medial shape description for biologically variable shapes, Proc. of IEEE Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA) 2000, pp. 235-242, June 2000
34. M. Styner, Th. Coradi and **G. Gerig**, Brain morphometry by distance measurement in a non-Euclidean, curvilinear space, Proceedings of Image Processing in Medical Imaging IPMI'99, Springer LNCS #1613, pp. 364-369, June 1999
35. L. Bullitt, S. Aylward, A. Liu, J. Stone, S. K. Mukherji, Chris Coffey, **G. Gerig**, and S. M. Pizer, 3-D Graph Description of the Intracerebral Vasculature from Segmented

- MRA and Tests of Accuracy by Comparison with X-ray Angiograms, Proceedings of Image Processing in Medical Imaging IPMI'99, pp. 308-321, June 1999
36. M. Berger and **G. Gerig**, Motion measurements in low contrast X-ray imagery, Lecture Notes in Computer Science 1496, Proc. of MICCAI'98, editors: W. M. Wells, A. Colchester, S. Delp, 832-841, Oct. 1998
  37. **G. Gerig**, D. Welti, Ch. Guttman, A. Colchester, G. Székely, Exploring the discrimination power of the time domain for segmentation and characterization of lesions in serial MR data, Springer LNCS #1496, 469-480, Oct. 1998
  38. D. EkatoDRAMIS, G. Székely and **G. Gerig**, Detecting and Inferring Brain Activation from functional MRI by Hypothesis-Testing based on the Likelihood Ratio, Springer LNCS #1496, Proc. of MICCAI'98, 578-589, Oct. 1998
  39. Kelemen, G. Székely, and **G. Gerig**, Three-dimensional Model-based Segmentation, in Conference Proceedings of 1998 Workshop on Biomedical Image Analysis (WBIA'98, held in conjunction with CVPR'98), Edited by Baba Vemuri, IEEE Computer Society Press, Los Alamitos, CA, ISBN0-8186-8460-7, pp. 4-13, June 1998
  40. Kelemen, G. Szekely, and **G. Gerig**, "Three-dimensional Model-based Segmentation", in Proceedings of MB3IA'98 IEEE International Workshop to be held in conjunction with ICCV'98 conference, Bombay, India, January 1998, pp. 87-96
  41. Yoshinobu Sato, Shin Nakajima, Hideki Atsumi, Thomas Koller, **Guido Gerig**, Shigeyuki Yoshida and Ron Kikinis, "Multi-Scale Line Filter for 3D Medical Images: Segmentation-Less Visualization of Curvilinear Structures", Springer LNCS #1205, J. Trocca, E. Grimson and R. Moesges (Eds.), Proc. of CVRMed-MRCAS'97 conference, Springer, pp. 213-222, 1997
  42. Tuomo Vehkomaki, **Guido Gerig** and Gabor Szekely "A user-guided tool for efficient segmentation of medical image data", , Springer LNCS 1205, Proc. of CVRMed-MRCAS'97 conference, Springer, pp. 685-694, 1997
  43. A. Kelemen, H-W. Reist, **G. Gerig** and G. Szekely, "Automatic segmentation of cell nuclei from confocal laser scanning microscopy images", Visual. in Biomed. Comput. Proc. VBC'96, Springer LNCS: 1131, pp. 193-202, Sept. 1996
  44. Ch. Brechbuehler, **Guido Gerig** and Gabor Szekely, "Compensation of spatial inhomogeneity in MRI based on a multi-valued image model and a parametric bias estimate", Visual. in Biomed. Comp., Springer LNCS #1131, pp. 141-146, Sept. 1996
  45. Th. Koller, **G. Gerig**, G. Szekely, and D. Dettwiler, "Multiscale Detection of Curvilinear Structures in 2-D and 3-D Image Data", Proceedings Fifth Int. Conf. on Computer Vision (ICCV'95), IEEE Computer Society Press, pp. 864-869, June 1995
  46. **G. Gerig**, G. Szekely, Georg Israel and Martin Berger, "Detection and characterization of unsharp blobs by curve evolution", Information Processing in Medical Imaging (IPMI'95), Y. Bizais et al. (Eds.), Series on Computational Imaging and Vision, Kluwer Academic Publishers, pp. 165-176, June 1995
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2. Statistical analysis of diffusion tensor image data based on first principles, Matthew Gribbin, Meagan Clement, Keith Muller, Michele Poe, Carissa Cascio, Matthew Jomier, Joseph Piven, and **Guido Gerig**, submitted March 2006
3. Simulation of Brain Tumors in MR Images for Evaluation of Segmentation Efficacy, Marcel Prastawa, Elizabeth Bullitt, and **Guido Gerig**, submitted IEEE TMI, May. 2006

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- **EMS**: Automatic MRI brain tissue segmentation
- **Head Circumference**: Head circumference measurement from 3D brain MRI
- **Imagine**: Dataflow pipeline software for ITK modules
- **Intensity Rescaler**: Adjustment of intensity histograms between pairs of volumetric images
- **Imconvert**: Conversion of various volumetric image formats
- **VALMET**: Tool for validation of intra- and inter-rater segmentation reliability
- **MeshValmet**: Tool for object surface distance validation

Guido Gerig, October 23, 2006