

Table of Contents

Objective Assessment of Image Quality

- On the Difficulty of Detecting Tumors in Mammograms 1
Arthur E. Burgess, Francine L. Jacobson, Philip F. Judy

- Objective Comparison of Quantitative Imaging Modalities Without the Use of a Gold Standard 12
John Hoppin, Matthew Kupinski, George Kastis, Eric Clarkson, Harrison H. Barrett

- Theory for Estimating Human-Observer Templates in Two-Alternative Forced-Choice Experiments 24
Craig K. Abbey, Miguel P. Eckstein

Shape Modeling

- The Active Elastic Model 36
Xenophon Papademetris, E. Turan Onat, Albert J. Sinusas, Donald P. Dione, R. Todd Constable, James S. Duncan

- A Minimum Description Length Approach to Statistical Shape Modelling . 50
Rhodri H. Davies, Tim F. Cootes, Chris J. Taylor

- Multi-scale 3-D Deformable Model Segmentation Based on Medial Description 64
Sarang Joshi, Stephen Pizer, P. Thomas Fletcher, Andrew Thall, Gregg Tracton

- Automatic 3D ASM Construction via Atlas-Based Landmarking and Volumetric Elastic Registration 78
Alejandro F. Frangi, Daniel Rueckert, Julia A. Schnabel, Wiro J. Niessen

Molecular and Diffusion Tensor Imaging

- A Regularization Scheme for Diffusion Tensor Magnetic Resonance Images 92
Olivier Coulon, Daniel C. Alexander, Simon R. Arridge

- Distributed Anatomical Brain Connectivity Derived from Diffusion Tensor Imaging 106
Geoffrey J.M. Parker, Claudia A.M. Wheeler-Kingshott, Gareth J. Barker

Study of Connectivity in the Brain Using the Full Diffusion Tensor from MRI	121
---	-----

*Philipp G. Batchelor, Derek L.G. Hill, Fernando Calamante,
David Atkinson*

Poster Session I: Registration and Structural Analysis

Incorporating Image Processing in a Clinical Decision Support System	134
--	-----

*Paul Taylor, Eugenio Alberdi, Richard Lee, John Fox, Margarita Sordo,
Andrew Todd-Pokropek*

Automated Estimation of Brain Volume in Multiple Sclerosis with BICCR	141
---	-----

*D. Louis Collins, Johan Montagnat, Alex P. Zijdenbos, Alan C. Evans,
Douglas L. Arnold*

Automatic Image Registration for MR and Ultrasound Cardiac Images ...	148
---	-----

Caterina M. Gallippi, Gregg E. Trahey

Estimating Sparse Deformation Fields Using Multiscale Bayesian Priors and 3-D Ultrasound	155
--	-----

*Andrew P. King, Philipp G. Batchelor, Graeme P. Penney,
Jane M. Blackall, Derek L.G. Hill, David J. Hawkes*

Automatic Registration of Mammograms Based on Linear Structures	162
---	-----

Robert Marti, Reyer Zwiggelaar, Caroline Rubin

Tracking Brain Deformations in Time-Sequences of 3D US Images.....	169
--	-----

Xavier Pennec, Pascal Cachier, Nicholas Ayache

Robust Multimodal Image Registration Using Local Frequency Representations	176
--	-----

Baba C. Vemuri, Jundong Liu, José L. Marroquin

Steps Toward a Stereo-Camera-Guided Biomechanical Model for Brain Shift Compensation	183
--	-----

Oskar Škrinjar, Colin Studholme, Arya Nabavi, James Duncan

Poster Session I: Functional Image Analysis

Spatiotemporal Analysis of Functional Images Using the Fixed Effect Model	190
---	-----

Jayasanka Piyaratna, Jagath C. Rajapakse

Spatio-temporal Covariance Model for Medical Images Sequences: Application to Functional MRI Data	197
--	-----

Habib Benali, Mélanie Péligrini-Issac, Frithjof Kruggel

Microvascular Dynamics in the Nailfolds of Scleroderma Patients Studied Using Na-fluorescein Dye 204

*Philip D. Allen, Chris J. Taylor, Ariane L. Herrick, Marina Anderson,
Tonia Moore*

Time Curve Analysis Techniques for Dynamic Contrast MRI Studies 211

Edward V.R. Di Bella, Arkadiusz Sitek

Detecting Functionally Coherent Networks in fMRI Data of the Human Brain Using Replicator Dynamics 218

Gabriele Lohmann, D. Yves von Cramon

Smoothness Prior Information in Principal Component Analysis of Dynamic Image Data 225

*Václav Šmíd, Miroslav Kárný, Martin Šámal, Werner Backfrieler,
Zsolt Szabo*

Estimation of Baseline Drifts in fMRI 232

François G. Meyer, Gregory McCarthy

Analyzing the Neocortical Fine-Structure 239

*Frithjof Kruggel, Martina K. Brückner, Thomas Arendt,
Christopher J. Wiggins, D. Yves von Cramon*

fMRI/EEG/MEG

Motion Correction Algorithms of the Brain Mapping Community Create Spurious Functional Activations 246

Luis Freire, Jean-François Mangin

Estimability of Spatio-temporal Activation in fMRI 259

*Andre Lehovich, Harrison H. Barrett, Eric W. Clarkson,
Arthur F. Gmitro*

A New Approach to the MEG/EEG Inverse Problem for the Recovery of Cortical Phase-Synchrony 272

Olivier David, Line Garner, Francisco J. Varela

Neural Field Dynamics on the Folded Three-Dimensional Cortical Sheet and Its Forward EEG and MEG 286

Viktor K. Jirsa, Kelly J. Jantzen, Armin Fuchs, J.A. Scott Kelso

Deformable Registration

A Unified Feature Registration Method for Brain Mapping 300

*Haili Chui, Lawrence Win, Robert Schultz, James Duncan,
Anand Rangarajan*

XIV Table of Contents

Cooperation between Local and Global Approaches to Register Brain Images	315
--	-----

Pierre Hellier, Christian Barillot

Landmark and Intensity-Based, Consistent Thin-Plate Spline Image Registration	329
---	-----

Hans J. Johnson, Gary E. Christensen

Validation of Non-rigid Registration Using Finite Element Methods	344
---	-----

Julia A. Schnabel, Christine Tanner, Andy D. Castellano Smith, Martin O. Leach, Carmel Hayes, Andreas Degenhard, Rodney Hose, Derek L.G. Hill, David J. Hawkes

Poster Session II: Shape Analysis

A Linear Time Algorithm for Computing the Euclidean Distance Transform in Arbitrary Dimensions	358
--	-----

Calvin R. Maurer, Jr., Vijay Raghavan, Rensheng Qi

An Elliptic Operator for Constructing Conformal Metrics in Geometric Deformable Models	365
--	-----

Christopher Wyatt, Yaorong Ge

Using a Linear Diagnostic Function and Non-rigid Registration to Search for Morphological Differences Between Populations: An Example Involving the Male and Female Corpus Callosum	372
---	-----

David J. Pettey, James C. Gee

Shape Constrained Deformable Models for 3D Medical Image Segmentation	380
---	-----

Jürgen Weese, Michael Kaus, Christian Lorenz, Steven Lobregt, Roel Truyen, Vladimir Pekar

Stenosis Detection Using a New Shape Space for Second Order 3D-Variations	388
---	-----

Qingfen Lin, Per-Erik Danielsson

Graph-Based Topology Correction for Brain Cortex Segmentation	395
---	-----

Xiao Han, Chenyang Xu, Ulisses Braga-Neto, Jerry L. Prince

Intuitive, Localized Analysis of Shape Variability	402
--	-----

Paul Yushkevich, Stephen M. Pizer, Sarang Joshi, J.S. Marron

A Sequential 3D Thinning Algorithm and Its Medical Applications	409
---	-----

Kálmán Palágyi, Erich Sorantin, Emese Balogh, Attila Kuba, Csongor Halmai, Balázs Erdőhelyi, Klaus Hausegger

Poster Session II: Functional Image Analysis

An Adaptive Level Set Method for Medical Image Segmentation	416
<i>Marc Droske, Bernhard Meyer, Martin Rumpf, Carlo Schaller</i>	
Partial Volume Segmentation of Cerebral MRI Scans with Mixture Model Clustering	423
<i>Aljaž Noe, James C. Gee</i>	
Nonlinear Edge Preserving Smoothing and Segmentation of 4-D Medical Images via Scale-Space Fingerprint Analysis	431
<i>Bryan W. Reutter, V. Ralph Algazi, Ronald H. Huesman</i>	
Spatio-temporal Segmentation of Active Multiple Sclerosis Lesions in Serial MRI Data	438
<i>Daniel Welti, Guido Gerig, Ernst-Wilhelm Radü, Ludwig Kappos, Gabor Székely</i>	
Time-Continuous Segmentation of Cardiac Image Sequences Using Active Appearance Motion Models	446
<i>Boudewijn P.F. Lelieveldt, Steven C. Mitchell, Johan G. Bosch, Rob J. van der Geest, Milan Sonka, Johan H.C. Reiber</i>	
Feature Enhancement in Low Quality Images with Application to Echocardiography	453
<i>Djamal Boukerroui, J. Alison Noble, Michael Brady</i>	
3D Vascular Segmentation Using MRA Statistics and Velocity Field Information in PC-MRA	461
<i>Albert C.S. Chung, J. Alison Noble, Paul Summers, Michael Brady</i>	
Markov Random Field Models for Segmentation of PET Images	468
<i>Jun L. Chen, Steve R. Gunn, Mark S. Nixon, Roger N. Gunn</i>	

Analysis of Brain Structure

Statistical Study on Cortical Sulci of Human Brains	475
<i>Xiaodong Tao, Xiao Han, Maryam E. Rettmann, Jerry L. Prince, Christos Davatzikos</i>	
Detecting Disease-Specific Patterns of Brain Structure Using Cortical Pattern Matching and a Population-Based Probabilistic Brain Atlas	488
<i>Paul M. Thompson, Michael S. Mega, Christine Vidal, Judith L. Rapoport, Arthur W. Toga</i>	
Medial Models Incorporating Object Variability for 3D Shape Analysis ...	502
<i>Martin Styner, Guido Gerig</i>	

XVI Table of Contents

Deformation Analysis for Shape Based Classification	517
<i>Polina Golland, W. Eric L. Grimson, Martha E. Shenton, Ron Kikinis</i>	
Subject Index	531
Author Index	535



<http://www.springer.com/978-3-540-42245-7>

Information Processing in Medical Imaging
17th International Conference, IPMI 2001, Davis, CA,
USA, June 18-22, 2001. Proceedings
Insana, M.F.; Leahy, R.M. (Eds.)
2001, XVI, 544 p., Softcover
ISBN: 978-3-540-42245-7