

Table of Contents – Part II

Cardiovascular Imaging: Planning, Intervention and Simulation

Automatic Multi-model-Based Segmentation of the Left Atrium in Cardiac MRI Scans	1
<i>Dominik Kutra, Axel Saalbach, Helko Lehmann, Alexandra Groth, Sebastian P.M. Dries, Martin W. Krueger, Olaf Dössel, and Jürgen Weese</i>	
Curvilinear Structure Enhancement with the Polygonal Path Image – Application to Guide-Wire Segmentation in X-Ray Fluoroscopy	9
<i>Vincent Bismuth, Régis Vaillant, Hugues Talbot, and Laurent Najman</i>	
Catheter Tracking via Online Learning for Dynamic Motion Compensation in Transcatheter Aortic Valve Implantation	17
<i>Peng Wang, Yefeng Zheng, Matthias John, and Dorin Comaniciu</i>	
Evaluation of a Real-Time Hybrid Three-Dimensional Echo and X-Ray Imaging System for Guidance of Cardiac Catheterisation Procedures ...	25
<i>R.J. Housden, A. Arujuna, Y. Ma, N. Nijhof, G. Gijssbers, R. Bullens, M. O'Neill, M. Cooklin, C.A. Rinaldi, J. Gill, S. Kapetanakis, J. Hancock, M. Thomas, R. Razavi, and K.S. Rhode</i>	
LBM-EP: Lattice-Boltzmann Method for Fast Cardiac Electrophysiology Simulation from 3D Images	33
<i>S. Rapaka, T. Mansi, B. Georgescu, M. Pop, G.A. Wright, A. Kamen, and Dorin Comaniciu</i>	
Cardiac Mechanical Parameter Calibration Based on the Unscented Transform	41
<i>Stéphanie Marchesseau, Hervé Delingette, Maxime Sermesant, Kawal Rhode, Simon G. Duckett, C. Aldo Rinaldi, Reza Razavi, and Nicholas Ayache</i>	

Image Registration I

Temporal Shape Analysis via the Spectral Signature	49
<i>Elena Bernardis, Ender Konukoglu, Yangming Ou, Dimitris N. Metaxas, Benoit Desjardins, and Kilian M. Pöhl</i>	

Joint T1 and Brain Fiber Log-Demons Registration Using Currents to Model Geometry	57
<i>Viviana Siless, Joan Glaunés, Pamela Guevara, Jean-François Mangin, Cyril Poupon, Denis Le Bihan, Bertrand Thirion, and Pierre Fillard</i>	
Automated Skeleton Based Multi-modal Deformable Registration of Head&Neck Datasets	66
<i>Sebastian Steger and Stefan Wesarg</i>	
Lung Registration with Improved Fissure Alignment by Integration of Pulmonary Lobe Segmentation	74
<i>Alexander Schmidt-Richberg, Jan Ehrhardt, René Werner, and Heinz Handels</i>	
3D Ultrasound-CT Registration in Orthopaedic Trauma Using GMM Registration with Optimized Particle Simulation-Based Data Reduction	82
<i>Ilker Hacihaliloglu, Anna Brounstein, Pierre Guy, Antony Hodgson, and Rafeef Abugharbieh</i>	
Hierarchical Attribute-Guided Symmetric Diffeomorphic Registration for MR Brain Images	90
<i>Guorong Wu, Minjeong Kim, Qian Wang, and Dinggang Shen</i>	
Uncertainty-Based Feature Learning for Skin Lesion Matching Using a High Order MRF Optimization Framework	98
<i>Hengameh Mirzaalian, Tim K. Lee, and Ghassan Hamarneh</i>	
Automatic Categorization of Anatomical Landmark-Local Appearances Based on Diffeomorphic Demons and Spectral Clustering for Constructing Detector Ensembles	106
<i>Shouhei Hanaoka, Yoshitaka Masutani, Mitsutaka Nemoto, Yukihiro Nomura, Takeharu Yoshikawa, Naoto Hayashi, and Kuni Ohtomo</i>	
A Novel Approach for Global Lung Registration Using 3D Markov-Gibbs Appearance Model	114
<i>Ayman El-Baz, Fahmi Khalifa, Ahmed Elnakib, Matthew Nitzken, Ahmed Soliman, Patrick McClure, Mohamed Abou El-Ghar, and Georgy Gimel'farb</i>	
Analytic Regularization of Uniform Cubic B-spline Deformation Fields	122
<i>James A. Shackleford, Qi Yang, Ana M. Lourenço, Nadya Shusharina, Nagarajan Kandasamy, and Gregory C. Sharp</i>	

Simultaneous Multiscale Polyaffine Registration by Incorporating Deformation Statistics	130
<i>Christof Seiler, Xavier Pennec, and Mauricio Reyes</i>	
Fast Diffusion Tensor Registration with Exact Reorientation and Regularization	138
<i>Junning Li, Yonggang Shi, Giang Tran, Ivo Dinov, Danny J.J. Wang, and Arthur W. Toga</i>	
Registration of Brainstem Surfaces in Adolescent Idiopathic Scoliosis Using Discrete Ricci Flow	146
<i>Minqi Zhang, Fang Li, Ying He, Shi Lin, Defeng Wang, and Lok Ming Lui</i>	
Groupwise Rigid Registration of Wrist Bones	155
<i>Martijn van de Giessen, Frans M. Vos, Cornelis A. Grimbergen, Lucas J. van Vliet, and Geert J. Streekstra</i>	
Automated Diffeomorphic Registration of Anatomical Structures with Rigid Parts: Application to Dynamic Cervical MRI	163
<i>Olivier Commowick, Nicolas Wiest-Daesslé, and Sylvain Prima</i>	
Large Deformation Diffeomorphic Registration of Diffusion-Weighted Images	171
<i>Pei Zhang, Marc Niethammer, Dinggang Shen, and Pew-Thian Yap</i>	
NeuroImage Analysis I	
Prediction of Brain MR Scans in Longitudinal Tumor Follow-Up Studies	179
<i>Lior Weizman, Liat Ben-Sira, Leo Joskowicz, Orna Aizenstein, Ben Shofty, Shlomi Constantini, and Dafna Ben-Bashat</i>	
Resting-State fMRI Single Subject Cortical Parcellation Based on Region Growing	188
<i>Thomas Blumensath, Timothy E.J. Behrens, and Stephen M. Smith</i>	
A Framework for Quantifying Node-Level Community Structure Group Differences in Brain Connectivity Networks	196
<i>Johnson J. GadElkarim, Dan Schonfeld, Olusola Ajilore, Liang Zhan, Aifeng F. Zhang, Jamie D. Feusner, Paul M. Thompson, Tony J. Simon, Anand Kumar, and Alex D. Leow</i>	
A Feature-Based Developmental Model of the Infant Brain in Structural MRI	204
<i>Matthew Toews, William M. Wells III, and Lilla Zöllei</i>	

Constrained Sparse Functional Connectivity Networks for MCI Classification	212
<i>Chong-Yaw Wee, Pew-Thian Yap, Daoqiang Zhang, Lihong Wang, and Dinggang Shen</i>	
MR-Less Surface-Based Amyloid Estimation by Subject-Specific Atlas Selection and Bayesian Fusion	220
<i>Luping Zhou, Olivier Salvado, Vincent Dore, Pierrick Bourgeat, Parnesh Raniga, Victor L. Villemagne, Christopher C. Rowe, Jurgen Fripp, and The AIBL Research Group</i>	
Hierarchical Structural Mapping for Globally Optimized Estimation of Functional Networks	228
<i>Alex D. Leow, Liang Zhan, Donatello Arienzo, Johnson J. GadElkarim, Aifeng F. Zhang, Olusola Ajilore, Anand Kumar, Paul M. Thompson, and Jamie D. Feusner</i>	
Characterization of Task-Free/Task-Performance Brain States	237
<i>Xin Zhang, Lei Guo, Xiang Li, Dajiang Zhu, Kaiming Li, Zhenqiang Sun, Changfeng Jin, Xintao Hu, Junwei Han, Qun Zhao, Lingjiang Li, and Tianming Liu</i>	
Quantitative Evaluation of Statistical Inference in Resting State Functional MRI	246
<i>Xue Yang, Hakmook Kang, Allen Newton, and Bennett A. Landman</i>	
Identifying Sub-Populations via Unsupervised Cluster Analysis on Multi-Edge Similarity Graphs	254
<i>Madhura Ingalkar, Alex R. Smith, Luke Bloy, Ruben Gur, Timothy P.L. Roberts, and Ragini Verma</i>	
Geodesic Information Flows	262
<i>M. Jorge Cardoso, Robin Wolz, Marc Modat, Nick C. Fox, Daniel Rueckert, and Sebastien Ourselin</i>	
Group-Wise Consistent Parcellation of Gyri via Adaptive Multi-view Spectral Clustering of Fiber Shapes	271
<i>Hanbo Chen, Xiao Cai, Dajiang Zhu, Feiping Nie, Tianming Liu, and Heng Huang</i>	
Diffusion Weighted Imaging	
Extracting Quantitative Measures from EAP: A Small Clinical Study Using BFOR	280
<i>A. Pasha Hosseinbor, Moo K. Chung, Yu-Chien Wu, John O. Fleming, Aaron S. Field, and Andrew L. Alexander</i>	
Sparse DSI: Learning DSI Structure for Denoising and Fast Imaging	288
<i>Alexandre Gramfort, Cyril Poupon, and Maxime Descoteaux</i>	

Fiber Density Estimation by Tensor Divergence	297
<i>Marco Reisert, Henrik Skibbe, and Valerij G. Kiselev</i>	
Estimation of Extracellular Volume from Regularized Multi-shell Diffusion MRI	305
<i>Ofer Pasternak, Martha E. Shenton, and Carl-Fredrik Westin</i>	
Nonnegative Definite EAP and ODF Estimation via a Unified Multi-shell HARDI Reconstruction	313
<i>Jian Cheng, Tianzi Jiang, and Rachid Deriche</i>	
Estimation of Non-negative ODFs Using the Eigenvalue Distribution of Spherical Functions	322
<i>Evan Schwab, Bijan Afsari, and René Vidal</i>	
Spatial Warping of DWI Data Using Sparse Representation	331
<i>Pew-Thian Yap and Dinggang Shen</i>	
Tractography via the Ensemble Average Propagator in Diffusion MRI	339
<i>Sylvain Merlet, Anne-Charlotte Philippe, Rachid Deriche, and Maxime Descoteaux</i>	
Image Segmentation II	
A 4D Statistical Shape Model for Automated Segmentation of Lungs with Large Tumors	347
<i>Matthias Wilms, Jan Ehrhardt, and Heinz Handels</i>	
Closed-Form Relaxation for MRF-MAP Tissue Classification Using Discrete Laplace Equations	355
<i>Alexis Roche</i>	
Anatomical Structures Segmentation by Spherical 3D Ray Casting and Gradient Domain Editing	363
<i>A. Kronman, Leo Joskowicz, and J. Sosna</i>	
Segmentation of the Pectoral Muscle in Breast MRI Using Atlas-Based Approaches	371
<i>Albert Gubern-Mérida, Michiel Kallenberg, Robert Martí, and Nico Karssemeijer</i>	
Hierarchical Conditional Random Fields for Detection of Gad-Enhancing Lesions in Multiple Sclerosis	379
<i>Zahra Karimaghloo, Douglas L. Arnold, D. Louis Collins, and Tal Arbel</i>	

Simplified Labeling Process for Medical Image Segmentation	387
<i>Mingchen Gao, Junzhou Huang, Xiaolei Huang, Shaoting Zhang, and Dimitris N. Metaxas</i>	
Liver Segmentation Approach Using Graph Cuts and Iteratively Estimated Shape and Intensity Constrains	395
<i>Ahmed Afifi and Toshiya Nakaguchi</i>	
Multi-Object Geodesic Active Contours (MOGAC)	404
<i>Blake C. Lucas, Michael Kazhdan, and Russell H. Taylor</i>	
A Pattern Recognition Approach to Zonal Segmentation of the Prostate on MRI	413
<i>Geert Litjens, Oscar Debats, Wendy van de Ven, Nico Karssemeijer, and Henkjan Huisman</i>	
Statistical Shape Model Segmentation and Frequency Mapping of Cochlear Implant Stimulation Targets in CT	421
<i>Jack H. Noble, René H. Gifford, Robert F. Labadie, and Benoît M. Dawant</i>	
Guiding Automatic Segmentation with Multiple Manual Segmentations	429
<i>Hongzhi Wang and Paul A. Yushkevich</i>	
Atlas-Based Probabilistic Fibroglandular Tissue Segmentation in Breast MRI	437
<i>Shandong Wu, Susan Weinstein, and Despina Kontos</i>	
Fast 3D Spine Reconstruction of Postoperative Patients Using a Multilevel Statistical Model	446
<i>Fabian Lecron, Jonathan Boisvert, Saïd Mahmoudi, Hubert Labelle, and Mohammed Benjelloun</i>	
Probabilistic Segmentation of the Lumen from Intravascular Ultrasound Radio Frequency Data	454
<i>E. Gerardo Mendizabal-Ruiz and Ioannis A. Kakadiaris</i>	
Precise Segmentation of Multiple Organs in CT Volumes Using Learning-Based Approach and Information Theory	462
<i>Chao Lu, Yefeng Zheng, Neil Birkbeck, Jingdan Zhang, Timo Kohlberger, Christian Tietjen, Thomas Boettger, James S. Duncan, and S. Kevin Zhou</i>	
A Study on Graphical Model Structure for Representing Statistical Shape Model of Point Distribution Model	470
<i>Yoshihide Sawada and Hidekata Hontani</i>	

Cardiovascular Imaging II

Quality Metric for Parasternal Long Axis B-Mode Echocardiograms	478
<i>Sri-Kaushik Pavani, Navneeth Subramanian, Mithun Das Gupta, Pavan Annangi, Satish C. Govind, and Brian Young</i>	
Hemodynamic Assessment of Pre- and Post-operative Aortic Coarctation from MRI	486
<i>Kristóf Ralovieh, Lucian Itu, Viorel Mihalef, Puneet Sharma, Razvan Ionasec, Dime Vitanovski, Waldemar Krawtschuk, Allen Everett, Richard Ringel, Nassir Navab, and Dorin Comaniciu</i>	
Linear Invariant Tensor Interpolation Applied to Cardiac Diffusion Tensor MRI	494
<i>Jin Kyu Gahm, Nicholas Wisniewski, Gordon Kindlmann, Geoffrey L. Kung, William S. Klug, Alan Garfinkel, and Daniel B. Ennis</i>	
Morphological Analysis of the Left Ventricular Endocardial Surface and Its Clinical Implications	502
<i>Anirban Mukhopadhyay, Zhen Qian, Suchendra M. Bhandarkar, Tianming Liu, Sarah Rinehart, and Szilard Voros</i>	
Prior-Based Automatic Segmentation of the Carotid Artery Lumen in TOF MRA (PASCAL)	511
<i>Jana Hutter, Hannes G. Hofmann, Robert Grimm, Andreas Greiser, Marc Saake, Joachim Hornegger, Arnd Dörfler, and Peter Schmitt</i>	
A Convex Relaxation Approach to Fat/Water Separation with Minimum Label Description	519
<i>Abraam S. Soliman, Jing Yuan, James A. White, Terry M. Peters, and Charles A. McKenzie</i>	
Regional Heart Motion Abnormality Detection via Multiview Fusion . . .	527
<i>Kumaradevan Punithakumar, Ismail Ben Ayed, Ali Islam, Aashish Goela, and Shuo Li</i>	
Global Assessment of Cardiac Function Using Image Statistics in MRI	535
<i>Mariam Afshin, Ismail Ben Ayed, Ali Islam, Aashish Goela, Terry M. Peters, and Shuo Li</i>	

Computer-Assisted Interventions and Robotics II

Ultrasound and Fluoroscopic Images Fusion by Autonomous Ultrasound Probe Detection	544
<i>Peter Mountney, Razvan Ionasec, Markus Kaizer, Sina Mamaghani, Wen Wu, Terrence Chen, Matthias John, Jan Boese, and Dorin Comaniciu</i>	

Direct 3D Ultrasound to Video Registration Using Photoacoustic Effect	552
<i>Alexis Cheng, Jin U. Kang, Russell H. Taylor, and Emad M. Boctor</i>	
Assessment of Navigation Cues with Proximal Force Sensing during Endovascular Catheterization	560
<i>Hedyeh Rafii-Tari, Christopher J. Payne, Celia Riga, Colin Bicknell, Su-Lin Lee, and Guang-Zhong Yang</i>	
Data-Driven Visual Tracking in Retinal Microsurgery	568
<i>Raphael Sznitman, Karim Ali, Rogério Richa, Russell H. Taylor, Gregory D. Hager, and Pascal Fua</i>	
Real-Time Motion Compensated Patient Positioning and Non-rigid Deformation Estimation Using 4-D Shape Priors	576
<i>Jakob Wasza, Sebastian Bauer, and Joachim Hornegger</i>	
Semi-automatic Catheter Reconstruction from Two Views	584
<i>Matthias Hoffmann, Alexander Brost, Carolin Jakob, Felix Bourier, Martin Koch, Klaus Kurzidim, Joachim Hornegger, and Norbert Strobel</i>	
Feature Classification for Tracking Articulated Surgical Tools	592
<i>Austin Reiter, Peter K. Allen, and Tao Zhao</i>	
Image-Based Tracking of the Teeth for Orthodontic Augmented Reality	601
<i>André Aichert, Wolfgang Wein, Alexander Ladikos, Tobias Reichl, and Nassir Navab</i>	
Intra-op Measurement of the Mechanical Axis Deviation: An Evaluation Study on 19 Human Cadaver Legs	609
<i>Lejing Wang, Pascal Fallavollita, Alexander Brand, Okan Erat, Simon Weidert, Peter-Helmut Thaller, Ekkehard Euler, and Nassir Navab</i>	
Real-Time Quantitative Elasticity Imaging of Deep Tissue Using Free-Hand Conventional Ultrasound	617
<i>Ali Baghani, Hani Eskandari, Weiqi Wang, Daniel Da Costa, Mohamed Nabil Lathiff, Ramin Sahebjavaher, Septimiu Salcudean, and Robert Rohling</i>	
A Comparative Study of Correspondence-Search Algorithms in MIS Images	625
<i>Gustavo A. Puerto and Gian-Luca Mariottini</i>	
3D Reconstruction in Laparoscopy with Close-Range Photometric Stereo	634
<i>Toby Collins and Adrien Bartoli</i>	

Image Registration: New Methods and Results

Registration Accuracy: How Good Is Good Enough? A Statistical Power Calculation Incorporating Image Registration Uncertainty	643
<i>Eli Gibson, Aaron Fenster, and Aaron D. Ward</i>	
Joint Tumor Segmentation and Dense Deformable Registration of Brain MR Images	651
<i>Sarah Parisot, Hugues Duffau, Stéphane Chemouny, and Nikos Paragios</i>	
Registration Using Sparse Free-Form Deformations	659
<i>Wenzhe Shi, Xiaohai Zhuang, Luis Pizarro, Wenjia Bai, Haiyan Wang, Kai-Pin Tung, Philip Edwards, and Daniel Rueckert</i>	
Registration of 3D Fetal Brain US and MRI	667
<i>Maria Kuklisova-Murgasova, Amalia Cifor, Raffaele Napolitano, Aris Papageorgiou, Gerardine Quaghebeur, J. Alison Noble, and Julia A. Schnabel</i>	
Author Index	675