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Nota di contenuto	An Efficient Finite Element Solution of the Generalised Bloch-Torrey Equation for Arbitrary Domains: L. Beltrachini et al -- Super-Resolution Reconstruction of Diffusion-Weighted Images using 4D Low-Rank and Total Variation: Feng Shi et al -- Holistic Image Reconstruction for Diffusion MRI: V. Golkov et al -- Alzheimer’s Disease Classification with Novel Microstructural Metrics from Diffusion-Weighted MRI: T. M. Nir et al -- Brain Tissue Micro-Structure Imaging from Diffusion MRI Using Least Squares Variable Separation: H. Farooq et al -- Multi-Tensor MAPMRI: How to Estimate Microstructural Information from Crossing

Fibers: M. Zucchelli et al -- On the Use of Antipodal Optimal Dimensionality Sampling Scheme on the Sphere for Recovering Intra-Voxel Fibre Structure in Diffusion MRI: A.P. Bates et al -- Estimation of Fiber Orientations Using Neighborhood Information: C. Ye et al -- A framework for creating population specific multimodal brain atlas using clinical T1 and diffusion tensor images: V. Gupta et al -- Alignment of Tractograms as Linear Assignment Problem: N. Sharmin -- Accelerating Global Tractography Using Parallel Markov Chain Monte Carlo: H. Wu et al -- Adaptive Enhancement in Diffusion MRI Through Propagator Sharpening: T. Dela Haije et al -- Angular Resolution Enhancement of Diffusion MRI Data Using Inter-Image Information Transfer: Geng Chen et al -- Crossing versus Fanning: Model Comparison Using HCP Data: A. Ghosh et al -- White Matter Fiber Set Simplification by Redundancy Reduction with Minimum Anatomical Information Loss: G. Zimmerman Moreno et al -- A Temperature Phantom to Probe the Ensemble Average Propagator Asymmetry: an In-Silico Study: M. Pizzolato et al -- Registration Strategies for Whole-Body Diffusion-Weighted MRI Stitching: J. Ceranka et al -- HARDI Feature Selection, Registration and Atlas Building for Aβ Pathology Classification: E. Schwab et al -- Reliability of Structural Connectivity Examined with Four Different Diffusion Reconstruction Methods at Two Different Spatial and Angular Resolutions: J. E. Villalon-Reina et al.

Sommario/riassunto

These Proceedings of the 2015 MICCAI Workshop “Computational Diffusion MRI” offer a snapshot of the current state of the art on a broad range of topics within the highly active and growing field of diffusion MRI. The topics vary from fundamental theoretical work on mathematical modeling, to the development and evaluation of robust algorithms, new computational methods applied to diffusion magnetic resonance imaging data, and applications in neuroscientific studies and clinical practice. Over the last decade interest in diffusion MRI has exploded. The technique provides unique insights into the microstructure of living tissue and enables in-vivo connectivity mapping of the brain. Computational techniques are key to the continued success and development of diffusion MRI and to its widespread transfer into clinical practice. New processing methods are essential for addressing issues at each stage of the diffusion MRI pipeline: acquisition, reconstruction, modeling and model fitting, image processing, fiber tracking, connectivity mapping, visualization, group studies and inference. This volume, which includes both careful mathematical derivations and a wealth of rich, full-color visualizations and biologically or clinically relevant results, offers a valuable starting point for anyone interested in learning about computational diffusion MRI and mathematical methods for mapping brain connectivity, as well as new perspectives and insights on current research challenges for those currently working in the field. It will be of interest to researchers and practitioners in the fields of computer science, MR physics, and applied mathematics.