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	Descrizione fisica	1 online resource (501 p.)
	Collana	Lecture Notes in Mathematics ; ; v.779
	Disciplina	004
	Soggetti	Optical data processing Radiology Computer Imaging, Vision, Pattern Recognition and Graphics Imaging / Radiology
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Note generali	Description based upon print version of record.
	Nota di bibliografia	Includes bibliographical references at the end of each chapters.
	Nota di contenuto	Object Segmentation and Markov Random Fields -- Fuzzy methods in medical imaging -- Curve Propagation, Level Set Methods and Grouping -- Kernel Methods in Medical Imaging -- Geometric Deformable Models: Overview and Recent Developments -- Active Shape and Appearance Models -- Statistical Atlases -- Statistical Computing on Non-Linear Spaces for Computational Anatomy -- Building Patient-Specific Physical and Physiological Computational Models from Medical Images -- Constructing a Patient-Specific Model Heart from CT Data -- Image-based haemodynamics simulation in intracranial aneursyms -- Atlas-based Segmentation -- Integration of Topological Constraints in Medical Image Segmentation -- Monte Carlo Sampling for the Segmentation of Tubular Structures -- Non-rigid registration using free-form deformations -- Image registration using mutual information -- Physical Model Based Recovery of Displacement and Deformations from 3D medical images -- Cardiovascular Informatics -- Rheumatoid Arthritis Quantifiction using Appearance Models -- Medical Image Processing for Analysis of Colon Motility -- Segmentation of Diseased Livers: A 3D Refinement Approach -- Intra and inter subject analyses of brain functional Magnetic Resonance Images (fMRI) -- Diffusion Tensor Estimation, Regularization and Classification -- From Local Q-Ball Estimation to Fibre Crossing

Tractography -- Segmentation of clustered cells in microscopy images by geometric PDEs and level sets -- Atlas-based whole-body registration in mice.

| Sommario/riassunto | Biomedical image analysis has become a major aspect of engineering sciences, and radiology in particular has become a dominant player in the field. Recent developments have made it possible to use biomedical imaging to view the human body from an anatomical or physiological perspective in a non-invasive fashion. Computer-aided diagnosis consists of developing algorithms and intelligent software components that can automatically process images and spot potential irregularities in the health chain. This book explains the process of computer assisted biomedical image analysis diagnosis through mathematical modeling and inference of image-based bio-markers. It covers five crucial thematic areas: methodologies, statistical and physiological models, biomedical perception, clinical biomarkers, and emerging modalities and domains. The dominant state-of-the-art methodologies for content extraction and interpretation of medical images include fuzzy methods, level set methods, kernel methods, and geometric deformable models. The models and techniques discussed are used in the diagnosis, planning, control and follow-up of medical procedures. Throughout the book, challenges and limitations are explored along with new research directions. This complete volume is an exceptional tool for radiologists, research scientists, senior undergraduate and graduate students in health sciences and engineering, and university professors. This book offers a unique guide to the entire chain of biomedical imaging, explaining how image formation is done, and how the most appropriate algorithms are used to address demands and diagnoses. |