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Nota di contenuto	Table of Contents; Title; Copyright; Preface; Acknowledgements; Introduction; PART 1: Methodological Bases; 1 Extraction and Segmentation of Structures in Image Sequences; 1.1 Problematics; 1.2 Overview of segmentation methods; 1.3. Summary of the different classes of deformable models; 1.4. Deformable templates; 1.5. Variational active contours; 1.6. Integration of a priori constraints in the formalism of variational contours; 1.7. Implementation examples in cardiac imaging; 1.8. Conclusion; 1.9. Bibliography; 2 Motion Estimation and Analysis; 2.1. Problematics; 2.2. Problem formulation 2.3. Transport methods2.4. Probabilistic approaches; 2.5. Image registration; 2.6. Local methods; 2.7. Hybrid methods; 2.8. Phase- based methods; 2.9. Registration and motion estimation in a sequence of images; 2.10. Evaluation of motion estimation methods; 2.11. Conclusion; 2.12. Bibliography; 3 Post-processing and Analysis of Dynamic Magnetic Resonance Images for Myocardial Perfusion Quantification; 3.1. Introduction; 3.2. Dynamic measurement of perfusion with contrast agents: reminder about the MRI sequences and

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## the different contrast agents used

3.3. Motion correction and contour segmentation of the myocardium: important preprocessing prior to quantitative analysis3.4. Semiquantitative perfusion analysis: calculation of relative parameters depending on the injection of the contrast medium; 3.5. Absolute parameters independent of the contrast agent injection (taking account of the arterial input): pharmacokinetic modeling; 3.6. Conclusion; 3.7. Bibliography; 4 Tensor Decomposition of a Dynamic Sequence of Images into Simple Elements; 4.1. Problematics; 4.2. Panorama of methods for the quantitative analysis of dynamic image sequences 4.3. Tensor decomposition methods of an image sequence into simple elements4.4. Specifications for radiotracer or contrast medium monitoring; 4.5. Specifications for the study of cardiac motion; 4.6. Conclusion; 4.7. Bibliography; PART 2: Application Examples; 5 Evaluation of Cardiac Structure Segmentation in Cine Magnetic Resonance Imaging; 5.1. Context: significance of the automatic segmentation of the cardiac structures; 5.2. Evaluation necessity; 5.3. Empirical evaluation methods; 5.4. Visual evaluation methods; 5.5. Supervised methods; 5.6. Non-supervised evaluation methods 5.7. Conclusion 5.8. IMPEIC and MEDIEVAL working groups; 5.9. Bibliography: 6 Phase-based Heart Motion Estimation in Multimodality Cardiac Imaging; 6.1. Phase images; 6.2. Optical flow motion estimation on the phase of the two single-orthant analytic signals and using a deformable mesh: application to cardiac MRI sequences; 6.3. Motion estimation by optical flow from the monogenic phase using a local affine model and multiscale analysis - application to ultrasonic cardiac sequences; 6.4. Bibliography; 7 Cardiac Motion Analysis in Tagged MRI; 7.1. Motion guantification by the SinMod method 7.2. Processing pipeline and features of the software inTag