Abstract

A framework for automatic segmentation of fibrocartilaginous disc of scoliosis affected spine from MRI image is presented in this paper. This method uses a combination of statistical and spectral texture features for discriminating closed regions representing fibrocartilaginous disc from background in MR images of the spine. Texture features are extracted from the closed regions based on the watershed approach. The feature selection step is based on principal component analysis and clustering process. It permits to decide among all the extracted features which ones resulted in the highest rate of good classification. With the help of the selected texture features and classification, the problem of over-segmentation underlying in existing automatic segmentation methods can be solved successfully by discriminating fibrocartilaginous disc from the background on MRI of scoliotic spines.
Frame Work for Auto Segmentation of Fibrocartilaginous Disc of Scoliosis Affected Spine

Assessment of 3-dimensional magnetic resonance imaging fast low angle shot images for computer assisted spinal surgery,


- C. L. Hoad, A. L. Martel, R. Kerslake, and M. Grevitt, A 3D MRI sequence for computer assisted surgery of the lumbar spine,


- B. A. Georgy and J. R. Hesselink, MR imaging of the spine: recent advances in pulse sequences and special techniques,


- Z. Peng, J. Zhong, W. Wee, and J. H. Lee, Automated vertebra detection and segmentation from the whole spine MR images,


- J. Carballido-Gamio, S. J. Belongie, and S. Majumdar, Normalized cuts in 3-D for spinal MRI segmentation,


- S. Booth and D. A. Clausi, Image segmentation using MRI vertebral cross-sections,


- P. Dokladal, I. Bloch, M. Couprie, D. Ruijters, R. Urtasun, and L. Garnero, Topologically controlled segmentation of 3D magnetic resonance images of the head by using morphological operators,


- C. Chevrefils, F. Cheriet, G. Grimard, and C. -E. Aubin, Watershed segmentation of intervertebral disk and spinal canal from MRI images,


- T. Hurtut and F. Cheriet, Automatic closed edge detection using level lines selection,


- N. Otsu, A threshold selection method from gray-level histograms,


**Index Terms**

Computer Science

Bio-medical Sciences
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Scoliosis  classification  over-segmentation  segmentation  fibrocartilaginous disc