

Watershed Segmentation of Intervertebral Disk and Spinal Canal from MRI Images

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ABSTRACT

Segmentation of regions of the human spine is today a fundamental problem in medical image analysis. While surveying the literature, it has been found out that no work has been done in segmentation of intervertebral disk and spinal canal by using watershed algorithms in MATLAB Environment. In this project, a segmentation method for intervertebral disk and spinal canal has been developed using the aid of watershed algorithms and validated segmentation on 2D MRI Data. This method can segment an intervertebral disk and spinal canal provided that the desired parameters are set properly. This method does not require any initialization while the others require an initialization from the region of interest. The visualization and quantitative evaluations of the segmentation results demonstrate the effectiveness of this approach. In this study, after a manual segmentation procedure, identification and investigations has been made for the potential use of MRI data for improving intervertebral disk and spinal canal shape approximation and 2D visualization for surgical planning usually for a scoliotic patient. Surgical planning now uses both 2D & 3D models that integrate data from multiple imaging modalities, each highlighting one or more aspects of morphology or functions.