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Segmentation of the spinous process and its acoustic shadow in vertebral ultrasound images

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Abstract

Spinal ultrasound imaging is emerging as a low-cost, radiation-free alternative to conventional X-ray imaging for the clinical follow-up of patients with scoliosis. Currently, deformity measurement relies almost entirely on manual identification of key vertebral landmarks. However, the interpretation of vertebral ultrasound images is challenging, primarily because acoustic waves are entirely reflected by bone. To alleviate this problem, we propose an algorithm to segment these images into three regions: the spinous process, its acoustic shadow and other tissues. This method consists, first, in the extraction of several image features and the selection of the most relevant ones for the discrimination of the three regions. Then, using this set of features and a LDA classifier, each pixel of the image is classified as belonging to one of the three

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