Image Analysis for Obturator Foramen Based on Marker-controlled Watershed Segmentation and Zernike Moments

Authors : Seda Sahin, Emin Akata

Abstract : Obturator foramen is a specific structure in pelvic bone images and recognition of it is a new concept in medical image processing. Moreover, segmentation of bone structures such as obturator foramen plays an essential role for clinical research in orthopedics. In this paper, we present a novel method to analyze the similarity between the substructures of the imaged region and a hand drawn template, on hip radiographs to detect obturator foramen accurately with integrated usage of Marker-controlled Watershed segmentation and Zernike moment feature descriptor. Marker-controlled Watershed segmentation is applied to seperate obturator foramen from the background effectively. Zernike moment feature descriptor is used to provide matching between binary template image and the segmented binary image for obturator foramens for final extraction. The proposed method is tested on randomly selected 100 hip radiographs. The experimental results represent that our method is able to segment obturator foramens with % 96 accuracy.

Keywords : medical image analysis, segmentation of bone structures on hip radiographs, marker-controlled watershed segmentation, zernike moment feature descriptor
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