

Automatic Prostate Segmentation by Using Multi-Objective Active Appearance Model in MR Images

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Abstract:

Prostate cancer is the second fatality cancerous factor in men that will treat, if it diagnoses in the earlier stages. Precise prostate segmentation in magnetic resonance (MR) images is mostly used for prostate volume estimation that is a key sign of the prostate disease. This paper presents a new fully automatic statistical model called multi-objective active appearance model (MOAAM) for prostate segmentation in MR images. At first, in training stage the appearance model includes shape and texture model is obtained by applying the principle component analyze (PCA) on limited sets of MR images which has been manually outlined by a radiologist expert. In continue, Sticks filter and non-linear filtering are employed in a preprocessing step to properly remove noise and extra edges, which provides a proper condition for the prostate region detection. Finally, a new multi-objective function is optimized with the help of a suitable searching algorithm, which leads to extract the prostate boundaries. The evaluation results indicate that our proposed method is less sensitive to edge information, initializing and has a stronger capture range in comparison with similar presented cases. The full paper will be presented after publishing.