Normalization of T2W-MRI Prostate Images using Rician a priori

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ABSTRACT

Prostate cancer is reported to be the second most frequently diagnosed cancer of men in the world. In practise, diagnosis can be affected by multiple factors reducing the chance to detect potential lesions. In the last decades, new imaging techniques mainly based on MRI are developed in conjunction with Computer-Aided Diagnosis (CAD) systems to help radiologists for such diagnosis. CAD systems are usually designed as a sequential processing consisting of four stages: pre-processing, segmentation, registration and classification. As a pre-processing, image normalization remains an important process to later design robust classifier and overcome the intensity variations inter-patients. However, little attention has been dedicated to the normalization of T2W-MRI prostate images. In this paper, we propose a method based on a Rician *a priori* in order to normalize T2W-MRI prostate images. A comparison with the state-of-the-art methods is also provided. The normalization of the data is assessed by comparing the alignment of the patient Probability Density Functions in both qualitative and quantitative manners. In both evaluation, the normalization using Rician *a priori* outperforms the other state-of-the-art methods.

Keywords: Prostate cancer, T2W MRI, Normalisation, pre-processing, computer-aided diagnosis

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