



## Development of a Fast Algorithm for Automatic Delineation of Prostate Gland on 2D Ultrasound Images

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This paper presents a fast and automatic algorithm for prostate segmentation in ultrasound images. An accurate prostate delineation on Transrectal ultrasound (TRUS) images has many applications including guiding the biopsy needle to the suspicious core when registered with a preoperative imaging modality, or in treatment planning and motion monitoring in therapy interventions. However, ultrasound image segmentation is a difficult task because of the speckles and relatively low tissue-to-tissue contrast in ultrasound images. The proposed method is based on the features extracted from the intensity of the TRUS images, specifically the gradient of it. Six 2D TRUS images acquired from one patient were used to evaluate the performance of the proposed algorithm. Quantitative assessment of the method was done by comparing the automatic segmentation results with the corresponding gold standard obtained from manual segmentation of the target organ. The resulted accuracy, sensitivity and specificity were  $98.69 \pm 0.27\%$ ,  $96.40 \pm 1.26\%$  and  $99.33 \pm 0.45\%$ , respectively.