

Automatic prostate segmentation in MRI using learned contexts on a sparse graph template

Bhavya Ajani¹, Karthik Krishnan¹

¹ Samsung Research Institute, Bangalore, India
{bhavya.ajani, k.krishnan}@samsung.com

Abstract. We present a learning based fully automatic method to detect and segment the prostate in T2 weighted MR scans. It consists of a localization stage which uses a learned global context to detect the prostate location. This is followed by a segmentation stage which uses a learned local context using prostatic segment specific discriminative classifiers, to compute the probability of a point being on the prostatic boundary. The final segmentation is obtained by via min-cut on a sparse spherical graph, centered at detected prostate location, with edge weight computed from the probability for the edge to intersect the prostate boundary. The method was evaluated on the Prostate MR Segmentation (PROMISE) challenge. Using 10 fold cross-validation, we obtain an overall DICE score of 0.849 and a mean run time of 6s on a commodity PC: Intel Xeon CPU E5 3GHz dual core with 8GB RAM and no GPU. With the final stage comprising graph cuts on a sparse graph, a benefit of this work is ability to perform real-time edits after automatic segmentation in a manner that combines user-edits with learned information.

The paper is currently under review. The full 8 page article will be uploaded after the review is completed.