

# Weakly Supervised Nuclei Segmentation in Histopathology Images

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## Abstract

Nuclei segmentation is a fundamental task in histopathology image analysis. Typically, such segmentation task requires significant effort to manually generate pixel-wise annotation for fully supervised training. To alleviate the manual effort, in this paper we propose a novel approach using points only annotation. Two types of coarse labels with complementary information are derived from the points annotation, and are then utilized to train a deep neural network. The fully-connected conditional random field loss is utilized to further refine the model without introducing extra computational complexity during inference. Experimental results on two nuclei segmentation datasets reveal that the proposed method is able to achieve competitive performance compared to the fully supervised counterpart and the state-of-the-art methods while requiring significantly less annotation effort.

Examination Committee: Prof. Dimitri Metaxas (Chair), Prof. Konstantinos Michmizos, Prof. Georgios Moustakides, Prof. Badri Nath