

BREAST CANCER pN-STAGE CLASSIFICATION FOR WHOLE SLIDE IMAGES

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ABSTRACT

Pathologic N-stage (pN-stage) classification is an essential task for breast cancer patient’s diagnosis and treatment. This challenging task requires accurate prediction on whether the cancer has metastasized to the regional lymph nodes in whole slide histological images. In this paper, we propose a novel framework to automatically predict pN-stage for whole slide images using our multi-scale ScanNet. Our model is evaluated on Camelyon 16 and Camelyon17 datasets.

Index Terms— Camelyon17, Deep learning, pN-stage Classification, Breast Cancer

1. METHOD DIFFERENCE

The basic method is similar from our first submission version. In this submission version, we made some important changes to further make use of our proposed network.

For slide-level detection, we use our dense mode to get a denser prediction. In the first two versions we submitted, the equivalent stride of multi-level ScanNet is 32. We change the dense coefficient from 8 to 16 in order to obtain an equivalent stride which is 16. In this way, we can obtain a denser probability map for each WSI.

For patient-level classification, we choose to train a random forest classifier which achieves better performance compared to an XGboost classifier.

Before submission, we evaluate our model on the train-*b* set by five-fold cross validation. We split the train-*b* set into five subsets and randomly choose one subset for validation and the others for training the random forest classifier. We adopt the quadratic weighted kappa score as the evaluation metric. The patient-level accuracy and slide-level accuracy of our model are 0.9554 and 0.9256.