

Image analysis

Handling of lymphocyte dense images

For WSIs with a huge lymphocytic count, we suggest to reduce the search space for possible infiltrates using heatmaps consisting of tiles ($16.19 \mu\text{m} \times 16.19 \mu\text{m}$), which represent a sum of CD3^+ and CD20^+ cells density maps.

Nuclei detection

We used an algorithm presented in [1]. The key idea of the approach is to take advantage of well-differentiated objects in each slide to learn about the appearance of the tissue and in particular about the appearance of low-differentiated objects. Well-differentiated objects are automatically selected from representative regions, then slide-specific visual context models [2] are learned, and finally the resulting posterior maps are used to perform the final detection steps on the WSI.

References

- [1] Brieu N, Pauly O, Zimmermann J, Binnig G, Schmidt G. Slide specific models for segmentation of differently stained digital histopathology whole slide images. *Proc SPIE*. 2016;9784:978410–978417.
- [2] Criminisi A, Shotton J, Bucciarelli S. Decision Forests with Long-Range Spatial Context for Organ Localization in CT Volumes. In: *MICCAI-PMMIA*; 2009.