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Opponent Review for the Bachelor Thesis:

"Attention Based High Resolution Image Classification" by Dominik Heindl

I enjoyed reading the bachelor thesis, as it deals with an interesting topic and is well written. The main idea presented is attention pooling for multiple instance learning (MIL) for histopathology images. The high resolution histopathology images are too large to fit onto the GPU (in one run), therefore they can't be handled the same way as "normal" images.

In the introduction the main concepts from literature of attention based pooling for MIL are explained. Additionally, the basics of basal cell carcinomas (BCC), which is the disease on the applied dataset, is well described. In my opinion, the introduction could be a bit more extensive on neural networks for histopathology images.

The methods and results are explained in a clear manner. The experiments were carried out in a methodologically sound manner. It appears to me, that Dominik Heindl has a very good understanding of the applied methods. The different methods were systematically compared and suitable statistical comparisons were conducted. Anyways, a comparison with standard pooling operations for MIL, such as mean/max pooling would have been interesting.

In the discussion, comments concerning the applicability to clinical practice are included. The importance of interpretability for machine learning algorithms in medical applications is highlighted in the thesis.

All in all, the thesis meets my criteria for an excellent bachelor thesis, and I am pleased to recommend this Bachelor thesis for acceptance with the highest possible degree.

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