Computational Evaluation of the Combination of Semi-Supervised and Active Learning for Histopathology Image Segmentation with Missing Annotations

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Context / Motivation

How to deal with missing annotations in digital pathology?

Related works / Gap

Medical image segmentation with missing annotations

- We test if combining different SSL and AL methodologies improves performance over using SSL, AL or other strategies separately for segmentation in histopathology images when training with missing annotations.

Our approach

- GlaS dataset
- Semi-Supervised Learning (SSL) [1]
- Active Learning (AL) [2]
- SSL + AL [3]
- Using only patches with annotations: Only Positive [4]

Results

- Sampled predictions
- Only Positive strategy performs as good as consistency-based SSL methods.
- Fixmatch and Freematch obtain similar results while Flexmatch does not perform well on this task.
- AL combined with Only Positive strategy improves model’s performance.
- AL random strategy obtains similar results as more elaborate selection methodologies.
- Future work: Test if other SSL/AL strategies and combinations are more suitable for histopathology image segmentation.

Conclusions

References