Milestone 1b

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1 Related works

1.1 Other solutions

Cross modality is a popular approach to machine learning in medical tasks, because big annotated datasets are hard to obtain. The approach proposed by Valindria et al. [1] is based on separate encoders and decoders for each modality, but with shared convolutional layers between them. Dou et al. [2] described "Chilopod"-shaped architecture, where all convolutional kernels are shared, but with modality-specific normalization layers.

1.2 Reproduced work

Our goal is to reproduce experiments presented in [3]. The paper uses U-net architecture introduced in [4] as a base segmentator and Cycle-Consistent Adversarial Networks [5] for utilising assistant modality. The architecture utilises a concept called "Knowledge distillation" first proposed by Hinton et al. [6] for compressing neural networks, then adapted for mutual learning of two networks by Ying et al. [7] based on previous work on Born Again Networks by Furlanello et al. [8]. Tests are conducted on the Multi-Modality Whole Heart Segmentation Challenge 2017 (MM-WHS 2017) dataset [9].

References

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