# Transfer learning

1. MedicalNet

Repository for transfer learning weights: <https://github.com/Tencent/MedicalNet#Demo>

Google drive to download the weights:

<https://drive.google.com/file/d/13tnSvXY7oDIEloNFiGTsjUIYfS3g3BfG/view>

Paper that uses the MedicalNet: <https://arxiv.org/pdf/1904.00625.pdf>

Other source that mentiones MedicalNet: <https://arxiv.org/ftp/arxiv/papers/1912/1912.09847.pdf>

1. ImageNet

Other approach: use the imagenet to initialize the weights

<https://www.sciencedirect.com/science/article/pii/S0169260721004491?casa_token=DiP3LhsH1r8AAAAA:oIP9lUSAO6AJM3J75ZqqG1RHqUEEYkPBeBY6k-3bdQsGarQrQmmeEVKW_lZjkOPDXDWdZIGOKQ>

The benefit of this approach was that we did not need to randomly initiate the weights for the lower layers of the network, but could exploit the low level features and filters already learned using the ImageNet dataset.

Weights: <http://www.cs.toronto.edu/~frossard/post/vgg16/>

1. BOWDA-Net

BOWDA-Net: <https://github.com/ahukui/BOWDANet>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7015773/>

Boundary-weighted Domain Adaptive Neural Network (BOWDA-Net) is a deep learning framework developed for the segmentation of prostate MR (Magnetic Resonance) images. Prostate MR image segmentation is an important task in medical image analysis, and it involves the delineation of the prostate gland and surrounding tissues for diagnostic and treatment planning purposes.

BOWDA-Net is designed to handle the domain shift problem that arises when the MR images used for training the segmentation model are acquired from different sources or protocols than the images used for testing. The domain shift can affect the performance of the segmentation model by degrading its generalization ability.

BOWDA-Net addresses this issue by introducing a boundary-weighted domain adaptation mechanism that selectively adjusts the feature representation of the model to the target domain without affecting the learned boundary information. This mechanism is integrated into a U-Net architecture that is commonly used for medical image segmentation.

Extra info:

* Some prostate datasets:

<https://cdas.cancer.gov/datasets/plco/20/#:~:text=The%20Prostate%20dataset%20is%20a,participants%20in%20the%20PLCO%20trial>.

* Some other transfer-learning sources:

<https://www.researchgate.net/publication/351575346_The_Federated_Tumor_Segmentation_FeTS_Challenge> I think this one doesn’t contain prostate

* More info about prostate in AI:

<https://eurradiolexp.springeropen.com/articles/10.1186/s41747-022-00288-8>

* Lots of pre-trained models in Nvidia but I couldn’t find anyone for prostate:

<https://docs.nvidia.com/clara/clara-train-sdk/index.html>

<https://catalog.ngc.nvidia.com/models?filters=&orderBy=dateModifiedDESC&query=>