TASK1 (Peri Vascular Space (PVS))

TRAINING MODEL

In the pre-processing step, RAS reorientation, z-score and min-max normalization were performed. Moreover, the two-dimensional axial slice images extracted from T1, T2, FLAIR image were merged into three-channel slice images. We trained the bounding box-based segmentation model as following input merged image with same z-axis position which is performed the two-dimensional minimum projection with the two images adjacent to the top and bottom along the z-axis. Next step, a MaskRetinaNet model was learned to the pyramid feature maps, classifier of PVS, regressor of bounding box, ground truth mask-guided segmentation module with the anchor-related bounding box regions. Finally, the inference results of the MaskRetinaNet model were generated by center regions of the predicted bounding boxes.

PARAMETERS

- Trained model: MaskRetinaNet (Customizing)
- Loss function
    - Classification : Weighted Focal Loss
    - Regression : Mean Absolute Error
    - Segmentation : CrossEntropy
- Optimizer

- Adam
- learning rate: 0.0001
- ReduceLROnPlateau (patience=10)

- Classification score threshold: 0.5
- ROI align module (scale=1/8, size=(15, 15))
- Backbone network: ResNet50

BOUNDING BOX

We generated the bounding boxes using a ground truth mask. For the 1st training, these bounding boxes were generated as the size of 6, 8, and 10 pixels and additional bounding boxes were generated slightly deviating from the center. For the final training, another boxes were generated according to the size of the mask region with 4 pixel margin.