Solution for Task 2

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1 Data processing

The processing methods we used are as follows: first, normalizing every MRI by its min and max voxel. Second, dividing 2D image data set into training set and validation set according to the ratio of 7:3.Third, stacking three Modalities, separating MRI scans into slices and saving slices as 2D images of 3 channels.

2 Model

We tried lots of 3D models and 2D models.Due to large spacing of axis z and small micro-bleeds area, the performance of 3D models were inferior to that of 2D models. 2D models we tried include Unet, ResUnet, Unet-Attention, ResUnet-Attention and so on, we found the performance of ResUnet and Unet are best.Based on that, we tried plenty of tricks to improve segmentation performance.

3 Training

In the training stage, We make sure that the positive(which include micro-bleeds) and the negative can be sampled equally.The input images were cropped into 320 x 320 patches, then flipped, rotated, shifted randomly.

4 Inference

In the inference stage, we predicted results by sliding window.The test time augmentation we used are flipping and rotating.Our experiments show that Unet and ResUnet are fittest.So, we combined the segment results of Unet and ResUnet.