A Two-Stage Strategy for Brain Tissue Segmentation

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A full paper is being prepared to describe our novel method in which we adopt a two-stage strategy to address this challenge task. In stage one, we use an auxiliary 3D CNN to predict a mask containing inner-brain region without skull. In stage two, we use another 3D CNN, which is more complicated, to do fine-grained brain tissue segmentation. To deal with the heavy imbalance problem between classes, we design a high recall loss function based on a generalized form of Dice loss. In order to utilize information from different modalities, we propose an efficient and sufficient feature fusion method. To avoid heavy overfitting problem in small dataset, we adopt some basic data augmentation methods. We use T1, T1_IR and FLAIR data in our pipeline. Additionally, we use MRBrainS13 training data to enhance our MRBrainS18 dataset. More details will be given in our full paper.