

Fully Convolutional Network with Hypercolumn Features for Brain Lesion Segmentation

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Abstract. The segmentation of stroke lesion is very necessary for diagnosis, planning treatment strategies and monitoring disease progression. We propose a fully convolutional network (FCN) with hypercolumns features and sparse pixel predictions (e.g. PixelNet) for automatic brain lesion segmentation. PixelNet extracts feature from multiple layers that correspond to the same pixel and samples a modest number of pixels across a small number of images for each SGD (Stochastic gradient descent) batch update. Deep Learning (DL) models like Convolutional Neural network (CNN) requires large training data to generalize the model where most of the biomedical problems have small available dataset. Moreover, the problem of label imbalance leads the CNN often converge to the certain labels. PixelNet deals these problems by utilizing sparse pixel prediction on a modest number of pixels. We utilize PixelNet in ISLES (Ischemic Stroke Lesion Segmentation) challenge 2017 and achieves 68% Dice accuracy as preliminary result.

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