Ischemic Stroke Lesion Segmentation with Convolutional Neural Networks for Small Data

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Abstract. For the automated lesion outcome prediction of post-treatment ischemic stroke, we propose an ensemble of the specialized Convolutional Neural Networks (CNNs) for small sample size of datasets. We use two types of CNNs, the residual U-Net[1] and the spatial pyramid pooling [2]. Various model characteristics in the CNN's such as the number of parameters, the number of layers, and patch sizes were chosen through empirical studies designed to compare the effect of each on validation error. A couple of methods handling unbalanced data were explored including [3].

Keywords: Fully convolutional networks, U-Net, 3D convolutional kernel, hyperparameter optimization

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