

# Stochastic Dense Network for Brian Lesion Segmentation

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**Abstract.** The segmentation of ischemic stroke lesion in brain magnetic resonance images(MRI) is quite challenging for its varying size and unknown shape. To tackle this problem, we proposed a convolutional neural network for an end-to-end, volume-to-volume lesion segmentation. Based on the 3D Unet structure, we apply dense connection to link every two layers to well combine the low level information with the high level one. In each layer, instead of 3D convolution, we adopt long short-term memory (LSTM) to capture the information of third dimension in MRI. To further reduce the over-fitting during training process, all the dense connections between layers are stochastically established. Due to the limited dataset, data augmentation is applied to the training dataset.