

# Brain MRI Segmentation Using Deep Convolutional Network

We applied a deep convolutional network with the use of hypercolumns. A paper describing the method is currently in preparation and will be made public as soon as possible. A short summarized description of the method is given in the following.

The method is fully automatic, and only requires the T2-weighted scan (T2 sequences). We begin with enhancing the contrast with histogram equalization, then pass each slice to a fully convolutional network. During inference, the regions that do not superpose importantly with the brain mask given by the inference result of the middle slice of each brain are automatically considered as background. The training process is based on the provided train images with classical dataset augmentation strategies. The provided label structures (0-8 for each tissue) are used. The average runtime during test is about **3.5 seconds** for axial images at 40 weeks, **2.2 seconds** for coronal images at 30 weeks, and **7 seconds** for coronal images at 40 weeks. The runtime is averaged on all corresponding test images using one NVIDIA GeForce GTX 1080 GPU.