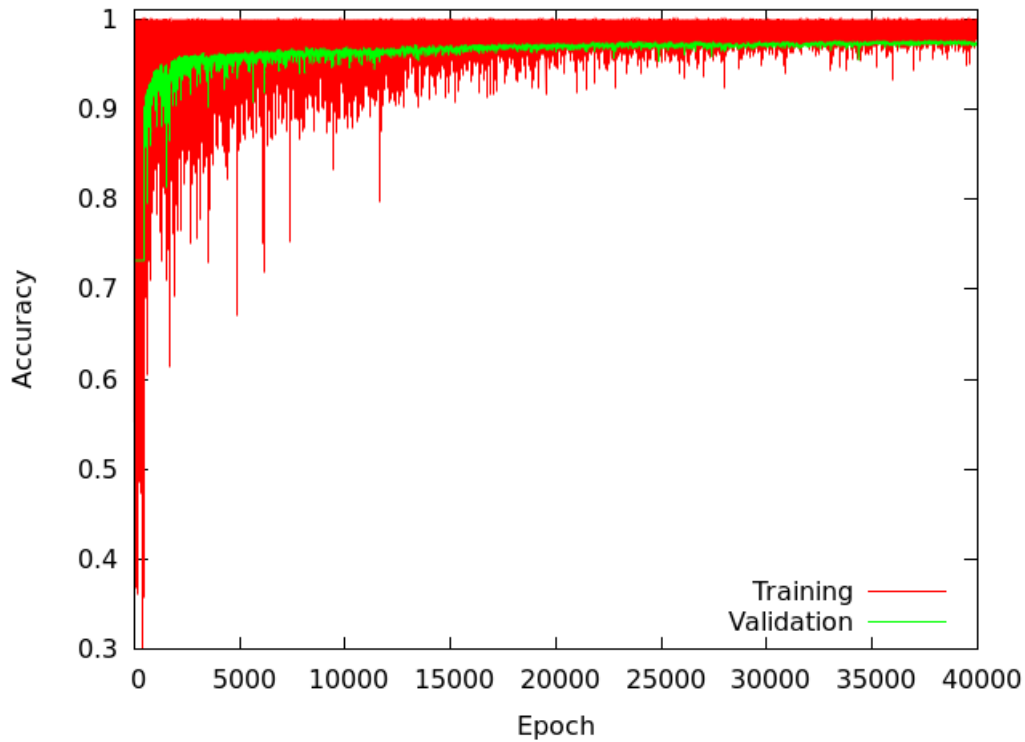


## Deep Learning Lab Course – Report for assignment 4

The specification for the neural network used for this assignment can be found in `u_net.json` and passed to `main.py` as command line argument to train the network. The learning curves resulting from running the network with the parameters given on the exercise sheet are shown in figure 1.

Figure 1: Learning curves



Since a different image is taken as training example in each iteration, the updates at the beginning are very noisy and training accuracies fluctuate greatly between 0.3 and 1. As the learning procedure starts to converge, the fluctuations get gradually smaller, leading to stable values above 0.95.

Figure 2 shows a close up view of the range 0.9–1.0 of the averaged learning curves where each of the 100 points of each curve represents the average value of the last 400 iterations. Although the largest improvements are made in the first 5000 iterations, one can clearly see that both accuracy values keep improving throughout the whole training.

The segmentation outputs are visualized in figure 3, which contains random images from the validation set (left), their label (middle) and the segmentation result (right). One can observe that the network produces outputs with very smooth cell boundaries. In the first example, the network segments the image almost perfectly. In the last example, the network fails at recognizing the uneven cell boundaries.

Figure 2: Averaged learning curves (each point is average over 400 previous epochs)

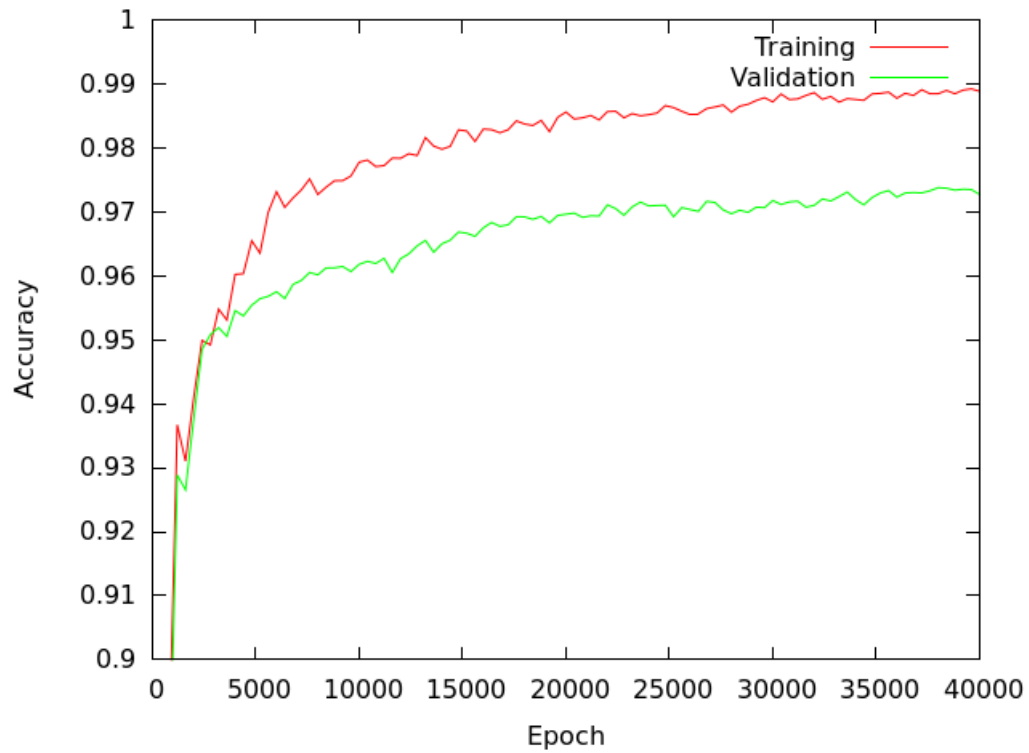


Figure 3: Random validation samples, their labels, and the corresponding segmentation result

