Report of Exercise 04

Implementation Approach

This exercise was implemented mainly using the instructions on the exercise sheet, reusing what was implemented in the last exercise and the lecture slides of the lecture on autoencoder.

Results

Training of the Autoencoder

In the following Figure 1, training and validation accuracy of the U-net after a training session is shown.
Training and validation error were calculated according to the formula given in the exercise sheet.

Since the training accuracy only regards one image, the zeros of this function are most likely images that that did not have a cell on it.
Since the validation accuracy regards the whole validation set, there are not so many jumps like in the plot of the training accuracy but is generally lower then the most accurate examples from the training accuracy.

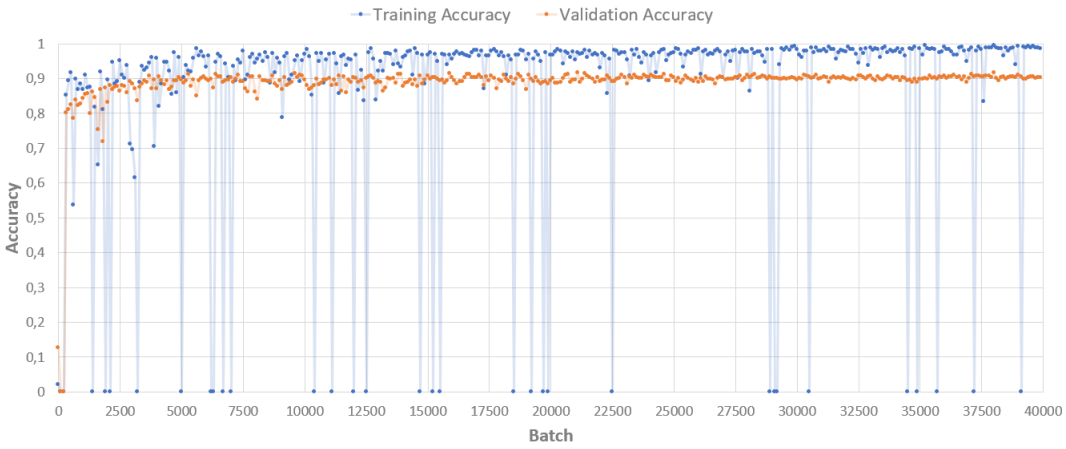

Figure 1: Training and Validation Accuracy

The following two figures, Figure 2 and Figure 3, show examples of outputs generated by U-net.

Figure 2: (1) Original Image, Labels, Output

In Figure 2, The output obviously differs from the labels. But looking at the original image it can be seen that the cell were the obvious error occurs is mostly transparent. The darker parts were correctly classified.

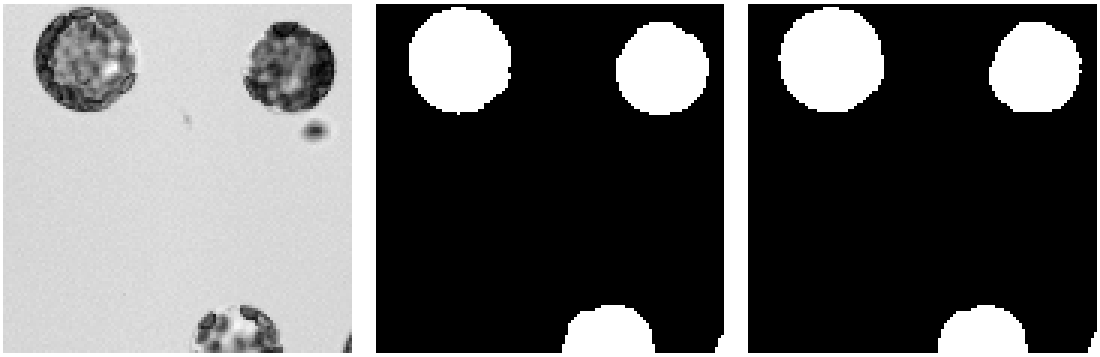

Figure 3: (2) Original Image, Labels, Output

Figure 3 shows an example were the the output and the labels are very similar. In contrast to the original image in Figure 2, this original image shows cells that are clearly distinguishable from the background and show less transparency.