Histological Analysis

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1 Count the brown spot

Our goal in this fist exercise is to count the number of brown spots in the image "101878272.png", shown in Figure 4. To do that first of all we have add in the folder of the plugins the plugin:

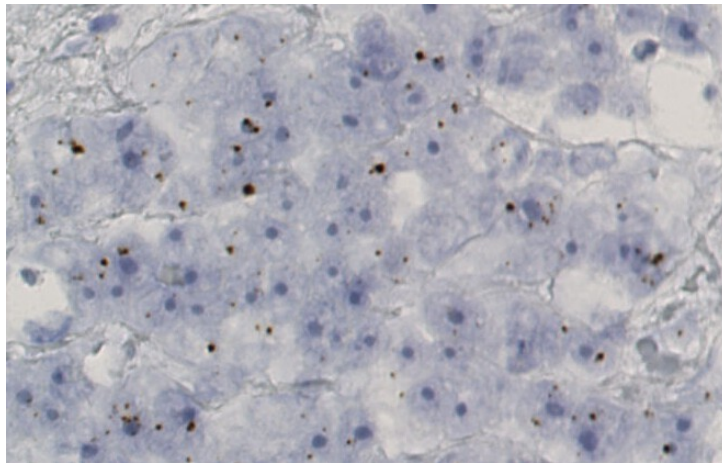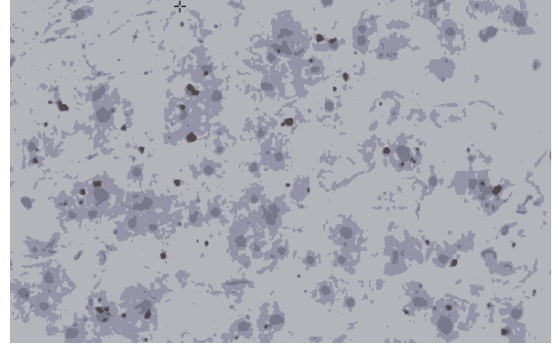- Color Conversion

- Color Deconvolution

- Color Quantization

Figure 1: Image 101878272.png

Once we have done this, we upload the image in icy, we use the plugin Color Quantization with the number of label set to 4. The result is going to be a mask with white dot's where the brown cells are located (Fig. 5a) and an image that shows all the different labels (Fig. 5c).
At this point we can use **Label Extractor**, with this we can see all the white points labels and we can see our counter going to 72.

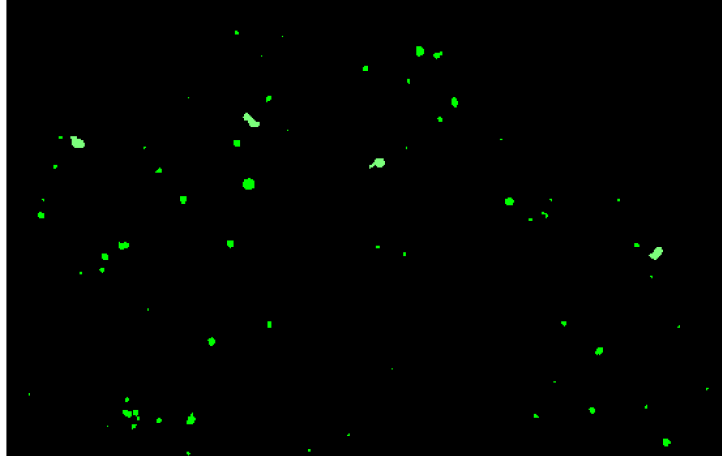(a) Mask with 4 label

(b) Image with 4 label

Figure 3: Counting

2 Color conversion

The goal of the second exercise is to find the centroids of the cells using a Neural Network, the data-set provided for the training is composed of 10 images, the name is BMGRAZ.

We use 9 images in training and 1 in test, you can find the code as an attachment or here : `https://colab.research.google.com/drive/1qVT_XXbY6qS6K2jicsHk1wRvjBRlwWIf?authuser=1#scrollTo=RNdjRJMKx_xK&uniqifier=1`

We used the structure FCRN-A define on the subject but with 256 filters on the middle and not 512.
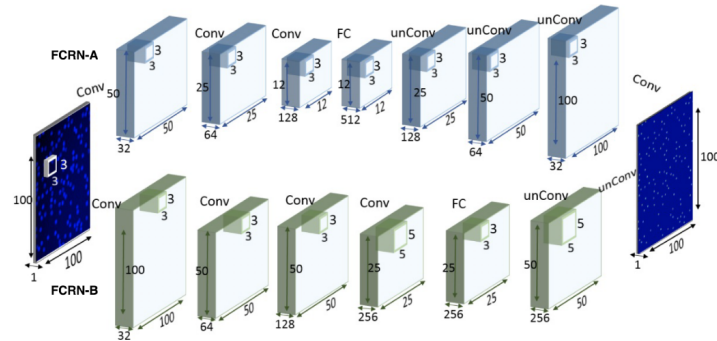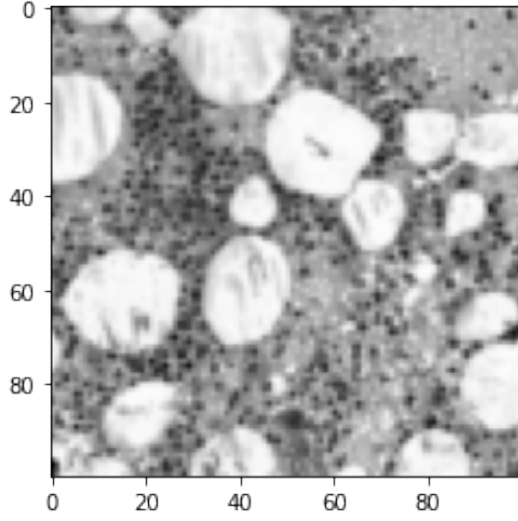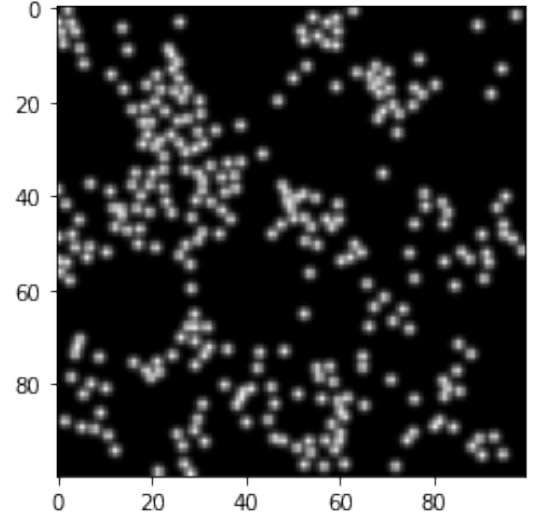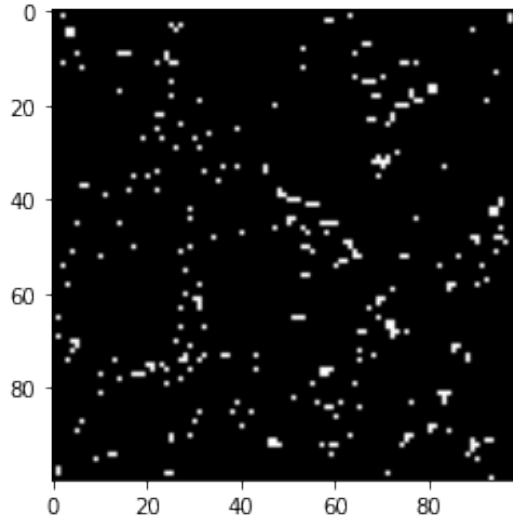

Figure 4: FCRN

(a) Test image

(b) Target

(c) Estimation

To run it you need :

- To create a folder source with 9 images for training
- To create a folder target with the 9 target for training
- To create a folder test with the 1 image for testing
- To create a folder test_target with the 1 target for testing

2.1 Conclusions

With such a small dataset we are not able to have perfect accuracy, but even with only 9 images as training the result seems very close to the target one.