

The Usage of Complexities for Classification of Neuron Cells

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The task of recognizing and classifying neurons is now relevant for histological image analysis. Nowadays, the cells are being counted manually by an expert, and therefore the image processing takes a lot of time. That is why it is important to create a tool to help to classify cells according to their mathematical parameters, so that such classification will be consistent with their histological type. Our task was to check the possibility of using the values of cell's complexity to determine whether it belongs to a histological type. A dataset of histological images of the mouse hippocampus was created for verification. It was marked up using the "cell counter" plugin in ImageJ. This set of images was processed in a special program in Matlab that counts the complexity of the specified areas. According to the obtained data, histograms of the dependence of the number of cells on the value of the complexity they possess were constructed. The results allow us to draw the following conclusions: firstly, the complexity of cells within the same type differ slightly and secondly, the average complexity of cells belonging to different types vary greatly, which means that the value of complexity could be used to differentiate cells by their types. Such a mathematical function could become an important part of a future tool for both pathologists and scientists in this field.

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