Automated Cell Counting and Region-specific Mapping in Whole Mouse Brain Light Microscopy Data

With increasingly demanding microscopy techniques, also the handling of data amounts and high-throughput analysis becomes more and more challenging. Utilizing latest convolutional neural networks and the experience of our professional annotator team, we join forces of artificial and human intelligence to turn these challenges into scientific results.

For the automatic segmentation of somata in whole mouse-brain imaging data, we developed a novel deep-learning workflow. With this method, we drastically reduce manual effort necessary for large-scale image analysis. Moreover, we propose a high-throughput method for the assignment of individual cell bodies to distinct brain regions referring to the Allen Reference Atlas. Based on this, we facilitate detailed and accurate measurements as well as 3D reconstructions of the whole organ.

Here, we present our image analysis pipeline as well as detailed results of the corresponding accuracy measurements. We further demonstrate the application of the soma-mapping plugin in the open-source software KNOSSOS.

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Terms and Conditions

Yes

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