

The BioVoxel Image Processing and Analysis Toolbox

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The “BioVoxel Toolbox” is a collection of plugins and macros for Fiji and ImageJ which is designed to assist in various image processing and analysis tasks such as lighting and background correction, image filtering, high quality feature extraction as well as binary object analysis. The “Filter Check” for example allows to test several image filter conditions in one step to easier pinpoint suitable pre-processing to improve consecutive analyses. The “Threshold Check” [1] enables to semi-quantitatively assess automatic binarization methods available in Fiji to achieve a high quality feature extraction. Tools working on binary images to split up connected cells or other features in a adaptive fashion or like the “Speckle Inspector” enable an object wise comparison of small features contained in bigger objects such as biomarker spots in cells or nuclei. Object extraction by secondary features is facilitated by the “Binary Feature Extractor”. Analysis and classification of objects by size and shape descriptors is facilitated by the “Extended Particle Analyzer” and color-coded “Shape Descriptor Maps”. The toolbox is rounded up with differential intensity plots and methods for object distribution analyses.

In addition to the described toolbox, a huge variety of further methods already available in the Fiji distribution are the basis on which BioVoxel as bioimaging analyst aims to bridge the gap between software development and a broad application by the end users in the area of life sciences. To this end BioVoxel further offers transmission of experience through courses and customized tool development.

Reference:

[1] Qualitative and Quantitative Evaluation of Two New Histogram Limiting Binarization Algorithms
Jan Brocher, 2014, IJIP 8(2), pp. 30-48.