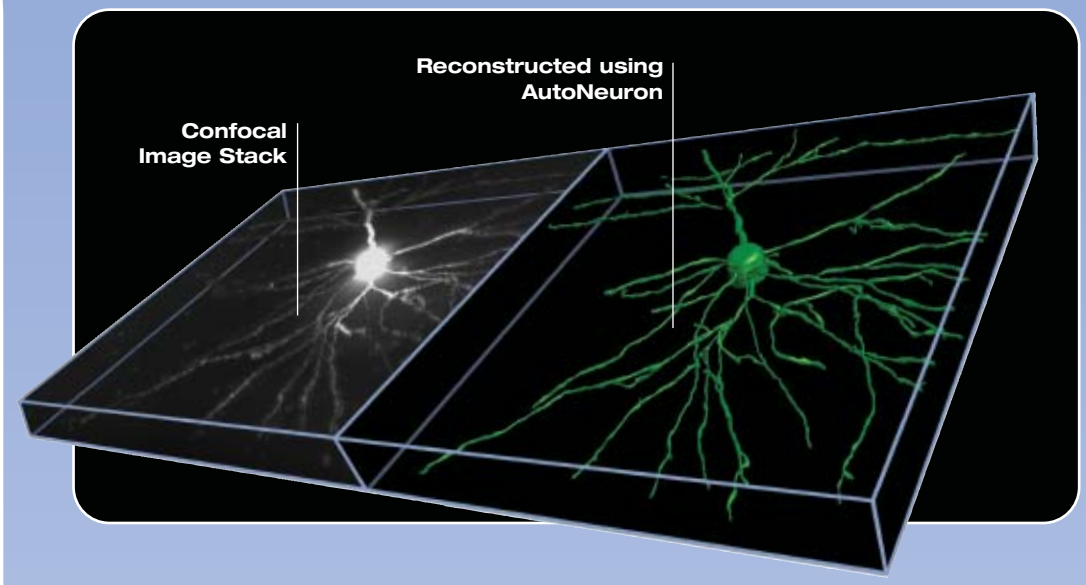
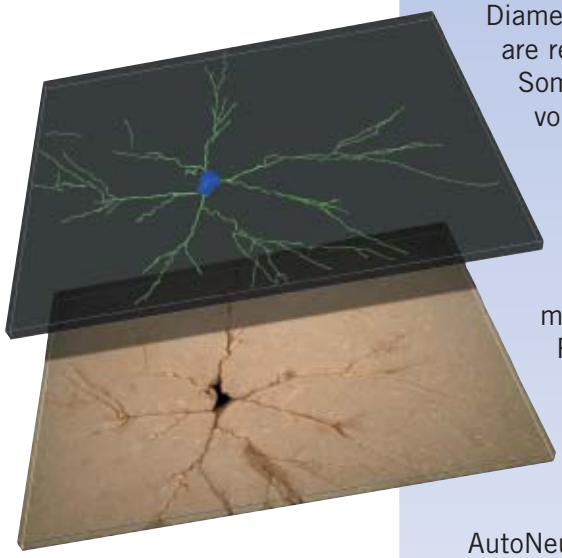
AutoNeuron®

AUTOMATED NEURON RECONSTRUCTION

MicroBrightField, Inc.

Perform automated neuron tracing in seconds on 3D volumes and 2D images





A brightfield 3D image with AutoNeuron reconstruction

AUTONEURON BENEFITS

AutoNeuron offers a very significant reduction in the time and effort required to reconstruct neurons in 2D and 3D. An innovative tracing algorithm quickly explores the entire image volume and identifies neuronal processes and somas. AutoNeuron creates models of neuronal trees as branching structures, complete with branch nodes, roots and endings. Diameters of the axons and dendrites are recorded at each traced point. Somas are reconstructed as a 3D volume using a set of contours.

Rapid Reconstruction: The AutoNeuron tracing time for a typical confocal or brightfield stack is under one minute on a standard desktop PC. This saves hours of manual tracing time compared to the current computer-assisted approach.

Compatible Output: AutoNeuron produces output in the Neurolucida® data file format. View and edit reconstructions in Neurolucida. Use Neurolucida Explorer for full morphometric analysis of complex branching structures. Quickly export results to standard document formats for publication.

Multiple Image Modalities: AutoNeuron can perform reconstructions from multiple image modalities, such as confocal, brightfield and widefield fluorescent images and stacks.

Proven Algorithm: AutoNeuron is patented technology based on more than ten years of published research in automated tracing of branching structures in biological tissue. MBF is the leader in analysis tools for neuroanatomical research. Hundreds of researchers trust our products for their research and publication needs – we are the proven source for neuroanatomical analysis.

Outstanding Customer Support: MBF has been successfully providing our expertise, training and support to the neuroscience community for two decades. Our Live Remote Control support is used to diagnose problems remotely and keep your system running smoothly.

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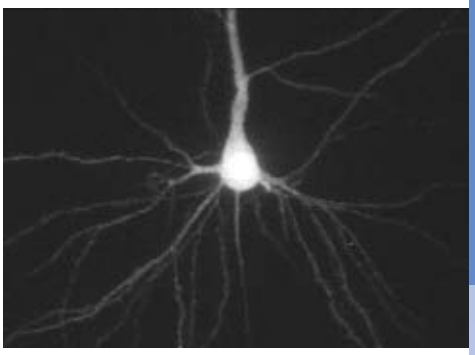
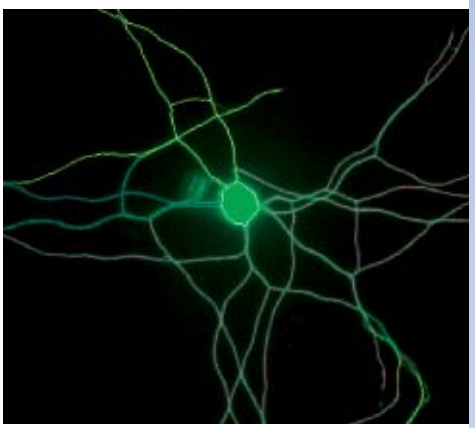
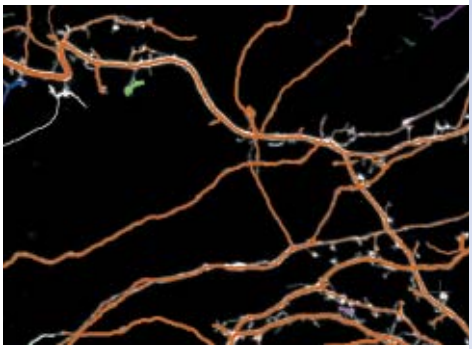


Trace confocal images in 3D



Trace brightfield and fluorescent images and stacks



Process width of branching structures is automatically recorded

MBF offers systems fully-integrated with your research microscope

ABOUT AUTONEURON

AutoNeuron is designed to automatically trace image stacks without image preprocessing. The simplified user interface allows for adjustment of basic tracing parameters, followed by a visual display of the model superimposed over the image stack projection.

SELECTED FEATURES

Tracing Features

- Trace typical stacks in less than 60 seconds
- Trace 3D Image stacks and 2D images
- Confocal, fluorescent and brightfield capable
- Exclude branches detached from soma
- Traces through process gaps
- Faint image detection setting
- Noise tolerant algorithm

Editing Features

- Add and remove traced points
- Detach and reconnect branches and trees
- Shift tree location
- Adjust branch diameter
- Insert or remove branch nodes
- Extend existing branches

Reconstruction Model Output

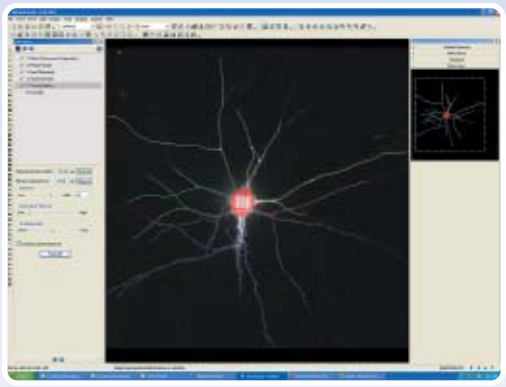
- Fully-editable output model
- Compatible with Neurolucida data format
- Generates 3D vector-based model
- Branches represented as tapered cylinders (conical frusta)
- Somas represented as contour sets
- Full branch length, order, volume, surface area analysis with Neurolucida Explorer
- Volume and shape analysis of soma models with Neurolucida Explorer

Graphics Output Features

- Rotate model through XYZ axes
- Correct for histological shrinkage
- Display with/without process thickness
- Export branch analysis to spreadsheet format

New Features for Version 2.0

- Fully interactive tracing over the entire image or one branch at a time
- Workflow Window guides you through the reconstruction process
- Support for 3D viewing of the reconstruction model superimposed over the voxelized 3D image
- Smoother soma contours
- Multi-soma detection in 3D volumes
- Improved branch-point placement technology
- Faster tracing and reconstruction with improved accuracy



Traces simple neurons in a few seconds; more complex neurons in 3D image stacks in less than a minute.

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