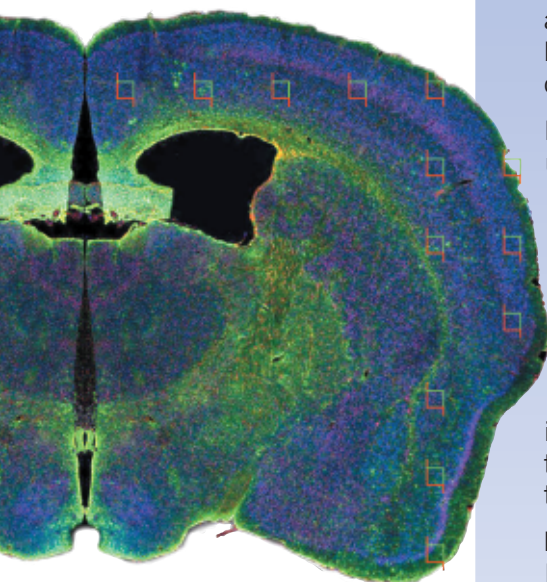




MicroBrightField, Inc.

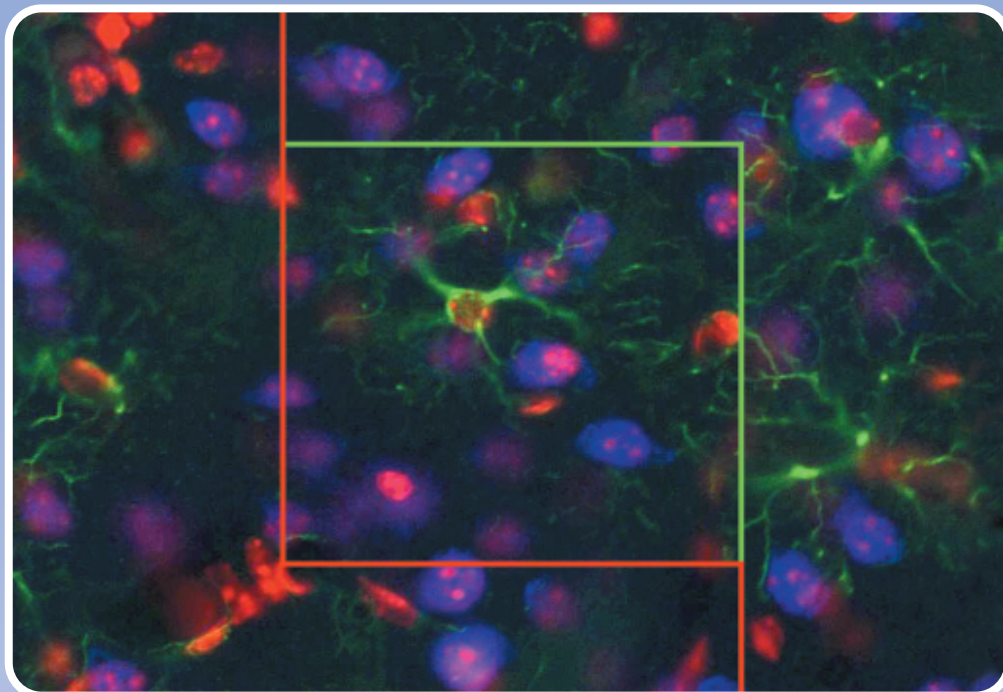
**Quantify cell
counts, lengths,
areas and
volumes using
the world's
foremost system
for stereology**



$$\sum Q^{-} \cdot \frac{t}{h} \cdot \frac{1}{asf} \cdot \frac{1}{ssf}$$

Stereo Investigator[®]

SYSTEM FOR STEREOLOGY



STEREO INVESTIGATOR BENEFITS

Use our powerful analysis tool to achieve more accurate results than biased techniques, in less time than direct measurement methods.

Reliable Analysis: Stereo Investigator uses unbiased methods to produce reliable results. The software's use of systematic random sampling conforms to the most rigorous stereological protocols.

Reduced Effort: Stereo Investigator pairs the most efficient methods with automated stage movement, sampling site placement, and easy-to-read graphical displays for rapid evaluation of your tissue. Stereo Investigator shortens the time between experiment and result.

Meets Your Research Needs: Stereo Investigator is compatible with all research microscopes—working with brightfield, fluorescent, or confocal. The software includes image analysis, mapping, graphical output and measurement tools all in one package.

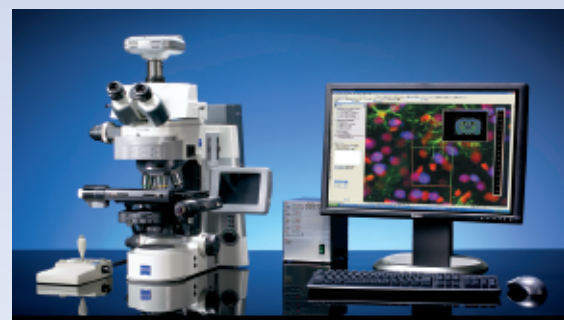
Proven Results: Stereo Investigator is the recognized leader in stereology

analysis tools and is used more than any other stereology analysis system—we are the proven source for stereology analysis systems.

Most Widely Published: More scientific papers (10 times more) cite Stereo Investigator as the tool of choice than any other stereological analysis product.*

Outstanding Support: MBF has been successfully providing our expertise, training, and support to researchers worldwide for over 18 years. Our Live Remote Control support is used to diagnose problems remotely and keep your system running properly.

* Source: PubMed database 2006

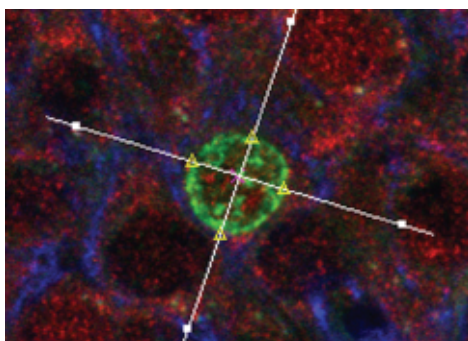


WHAT IS STEREOLOGY?

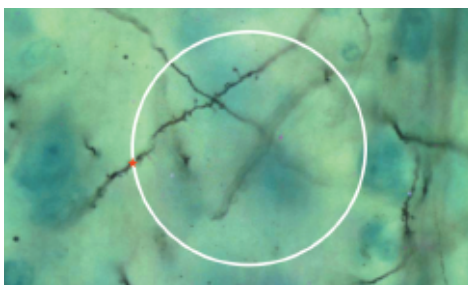
Stereology is a method used to quantify properties of 3D and 2D objects. The proper use of stereology results in unbiased and accurate estimates. The basic tool of stereology is the “probe”—a graphical overlay used to sample randomly selected subsets of the object of interest. Stereo Investigator automates the probe layout and stage movement, making analysis of tissue specimens simple and efficient.



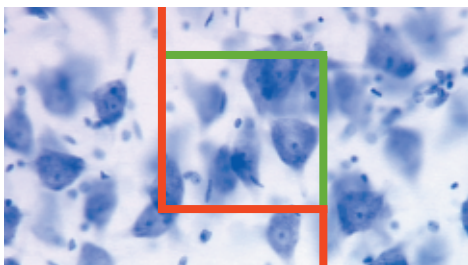
Cavalieri estimator for volume



The nucleator analyzes cell volume



Quantify length with space balls or isotropic virtual planes



Works with brightfield, widefield fluorescence, and confocal images

ABOUT STEREO INVESTIGATOR

Stereo Investigator is advanced scientific software for design-based stereology. Stereo Investigator can analyze data from multiple modalities: using live images from digital or video cameras; stored image sets from confocal microscopes, electron microscopes, and scanning tomographic sources, or through the microscope oculars using our patented Lucivid™. Stereo Investigator controls a motorized XYZ stage for integrated navigation through tissue sections, allowing for effortless measurement through many fields-of-view. Stereo Investigator's Serial Section Manager integrates unlimited sections into a single data file, maintaining each section in aligned 3D space for stereological analysis and systematic random sampling. Stereo Investigator may be used to analyze isotropic, vertical, or preferentially cut sections.

The estimation results and confidence levels are calculated and displayed on demand, or can be exported.

Stereo Investigator also features sophisticated tools for anatomical mapping. These mapping tools can be used to delineate regions of interest for stereological estimators, to map cell distributions, to prepare anatomical maps for publication, and to perform detailed morphometric analyses.

Stereo Investigator offers the most comprehensive implementation of stereological probes and methods available. Plug-in modules are available for confocal and MRI analysis, 3D solid modeling, and virtual slide creation.

>> www.StereoInvestigator.com

SELECTED FEATURES

- Stereology Workflow reduces training time — walks you through every step of the optical fractionator and the physical fractionator counting methods
- Additional workstation licenses are available for offline processing
- Count multiple cell types simultaneously
- Automated guard zone support
- In-bounds visual indicators in X,Y, and Z
- Combine counting with local probes
- Automated stage movement speeds data collection
- Quality control and data review features
- Complete editing capabilities
- Individual and grouped results
- Coefficient of Error (CE) and Variance (CV) calculations
- Documentation of equations and formulae
- Comprehensive user manual and HTML help
- Integrate data from serial sections
- Automatic serial section alignment tools
- Automatically compensate for missing sections
- Flexible hardware support for all research microscopes
- Support for Olympus Fluoview 300, 500, & 1000 confocal microscopes
- Support for Olympus DSU confocal
- Automated image stack acquisition for offline analysis
- Switch between live and stored images
- Data calibrated to your microscope objective lenses
- Automatic parcentric and parfocal correction
- Image processing and morphometric analysis tools included

Design-Based Stereological Estimators

- Optical fractionator
- Physical fractionator
- Space Balls
- Nucleator
- Spatial distribution
- Cavalieri estimator for area and volume
- Over 20 additional probes

“Our system works perfectly. We use it every day and don't have any problems whatsoever. Thanks for the good systems.”

— Grazyna Rajkowska, Ph.D.

For a full list of the over 300 features of Stereo Investigator, visit www.stereoinvestigator.com

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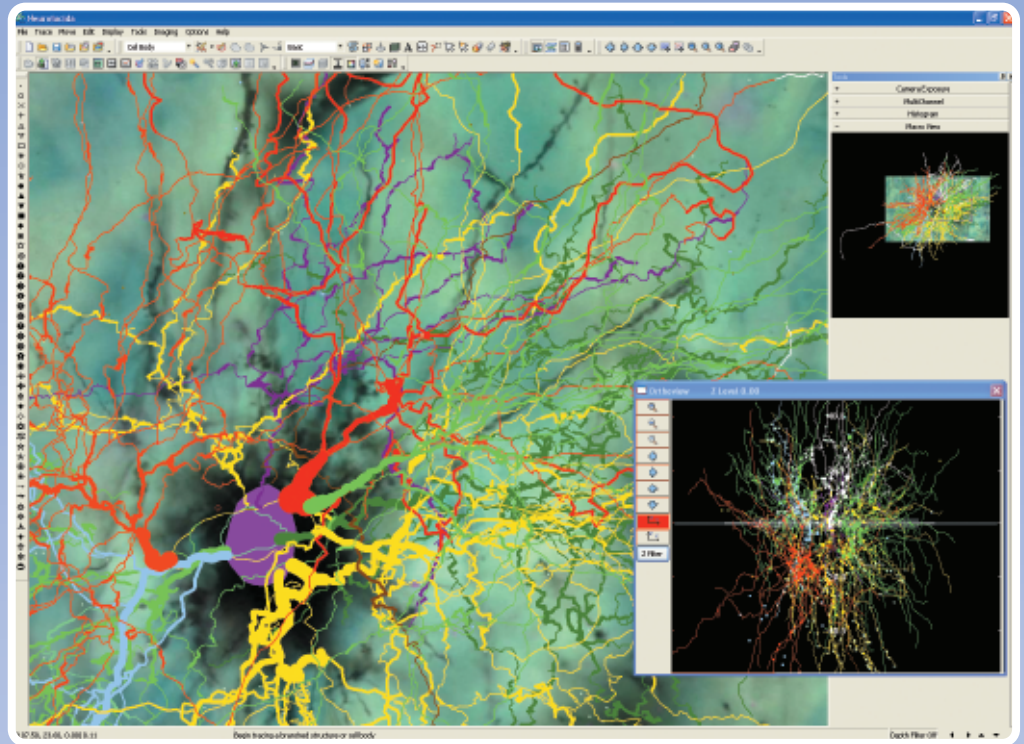


MicroBrightField, Inc.

**Neuroanatomical
analysis system
for neuron tracing,
3D mapping,
image analysis
and morphometry**

Neurolucida[®]

SYSTEM FOR NEUROANATOMICAL ANALYSIS



NEUROLUCIDA BENEFITS

Powerful analysis tools bring comprehensive quantitative morphometry to your lab, providing accuracy, efficiency, value, and results in a versatile system that can handle your research needs.

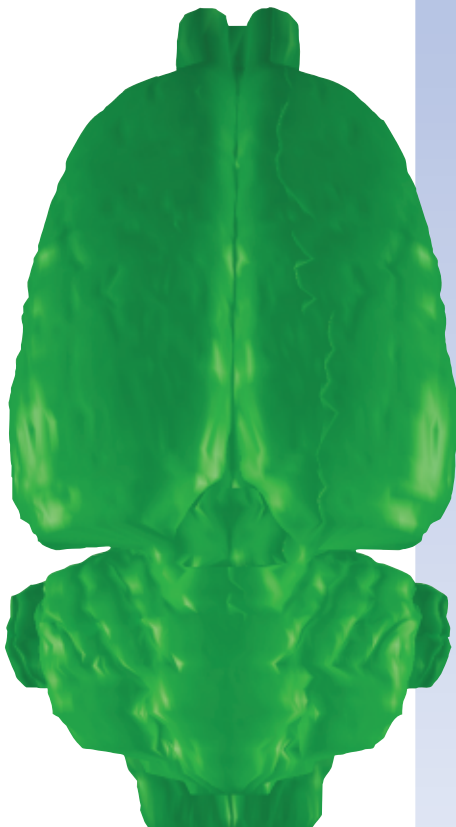
Precision: Easy to use interface for rapid results. Acquire data through multiple Z levels, capturing the full 3D extent of neurons and brain regions. Neurolucida automatically moves the microscope stage as you work, and records each data point in 3D space.

Full Morphometric Analysis: Neurolucida and Neurolucida Explorer, its companion program, provide automatic analysis of hundreds of quantitative parameters – complicated 3D anatomical features are thoroughly analyzed. Quickly export results to standard document formats for publication.

Versatility and Value: Neurolucida meets your research needs, no matter how diverse. Our systems support live digital video and acquired images from multiple image modalities, such as brightfield, fluorescence, confocal, and MRI. Neurolucida works with virtually any research microscope.

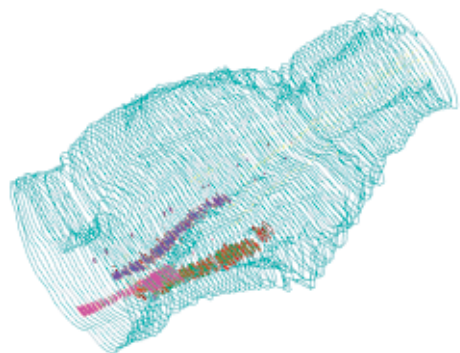
Proven Results: Neurolucida is the recognized leader in neuroanatomical analysis tools. Hundreds of researchers trust Neurolucida for their research and publication needs – we are the proven source for neuroanatomical analysis.

Outstanding Customer Support: MBF has been successfully providing our expertise, training, and support to researchers worldwide for over 18 years. Our Live Remote Control support is used to diagnose problems remotely and keep your system running smoothly.

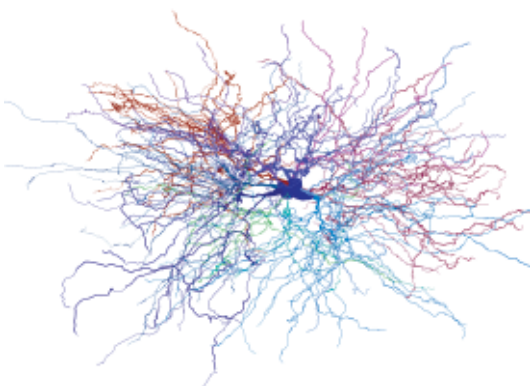




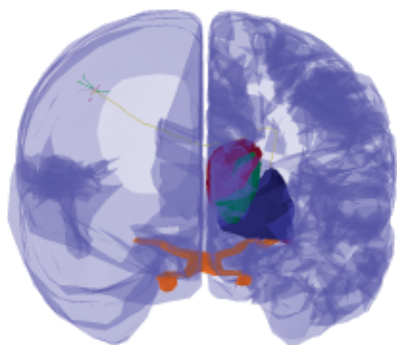
MBF offers systems fully-integrated with your research microscope



Reconstruction created from serial sections



A complex neuron reconstructed from multiple sections



3D representation and visualization of anatomical structures

ABOUT NEUROLUCIDA

Neurolucida is advanced scientific software for performing brain mapping, neuron tracing, anatomical mapping, and morphometry. Neurolucida has the flexibility to handle data in many formats: using live images from digital or video cameras; stored image sets from confocal microscopes, electron microscopes, and scanning tomographic sources, or through the microscope oculars using our patented Lucivid™. Neurolucida controls a motorized XYZ stage for integrated navigation through tissue sections, allowing for sophisticated analysis from many fields-of-view. Neurolucida's Serial Section Manager integrates unlimited sections into a single data file, maintain-

ing each section in aligned 3D space for full quantitative analysis.

Neurolucida's neuron tracing capabilities include 3D measurement and reconstruction of branching processes. Neurolucida also features sophisticated tools for mapping — delineate and map anatomical regions for detailed morphometric analyses.

Neurolucida uses advanced computer-controlled microscopy techniques to obtain accurate results and speed your work. Plug-in modules are available for confocal and MRI analysis, 3D solid modeling, and virtual slide creation.

>> www.neurolucida.com

SELECTED FEATURES

Tracing Neurons

- Trace and classify spines, boutons and varicosities
- Use circular cursor to set branch diameter
- Automatic serial section alignment procedures
- Depth measurement automatically performed while focusing
- Automatic return to branch points assures complete tree tracing

Anatomical Mapping

- Fifty marker types for specifying distinctive objects
- Macro View window shows whole tracing for orientation and navigation
- Double, triple, and quadruple marker labeling
- Cytoarchitectonic atlas
- Correct for tissue shrinkage

Image Processing and Analysis Features

- Images maintained in 3D space
- Background correction for illumination irregularities
- Convolution, transformation and edge detection filters
- Switch between live and stored images
- Adjust image transparency
- Automatic object detection
- View and analyze virtual slides over the internet

Editing

- Insert missed points, branch points and spines
- Create sets of anatomical objects

Morphometric Analysis

- Tree analysis, including length, number, volume, surface area, and spine distribution
- Perimeter, area, volume, and surface area of anatomical regions
- Branch order analysis
- Analysis by cellular layer
- Spine and bouton density distributions
- Enhanced Sholl analysis
- Dendrogram analysis

Hardware Integration

- Flexible hardware support for all research microscopes
- Use with brightfield, fluorescence, confocal, EM, and MRI
- Stage movement synchronized with tracing data
- Current focal depth always indicated
- Integration with fluorescence filterwheel
- Lens calibration system with automatic parcentric and parfocal correction
- Multiple digital and video cameras supported

Cell Analysis

- Distribution, size, shape, and more
- Nearest Neighbor analysis
- Double label analysis

Visualization Features

- Dynamic 3D visualization
- Publication quality output

"Our system worked almost every day for the last eight years with no major failure (we published more than 15 papers using Neurolucida). A terrific machine!"

— Ferdinando Rossi

Visit www.neurolucida.com for a complete list of more than 300 features.

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MicroBrightField, Inc.



MicroBrightField, Inc.

**A fully integrated
confocal stereology
system for
accurate
quantification
using multiple
fluorescent labels**

Stereo Investigator®

CONFOCAL SPINNING DISK



Stereology is the accepted method for performing cell counts and other quantitative analyses in neurobiology. Stereo Investigator®, the world's leading system for unbiased stereology, is designed to be time efficient and enable semi-automated quantification of histological samples.

Confocal microscopy is a powerful tool widely used by researchers to clearly visualize multiple labels and co-localization within a biological specimen. The Confocal Spinning Disk

System provides fast imaging at a much lower price point and greater versatility than laser scanning confocal systems.

Stereo Investigator, combined with a spinning disk confocal microscope, allows you to gather data rapidly, without bias or unnecessary over-sampling, getting you quickly to statistically valid results. MBF is pleased to offer the first complete confocal stereology system—a tight integration of Stereo Investigator and the Olympus DSU microscope.

CONFOCAL SD BENEFITS

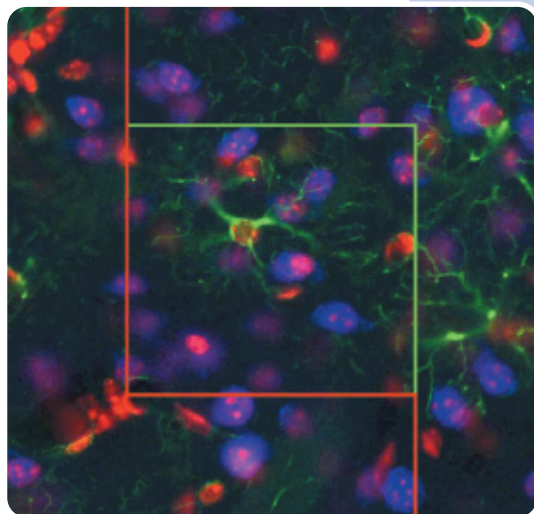
Accurate: Uses stereology to count multiple fluorescently labeled cells (e.g., GFP protein family or immunohistochemistry) using rapid, real time confocal imaging.

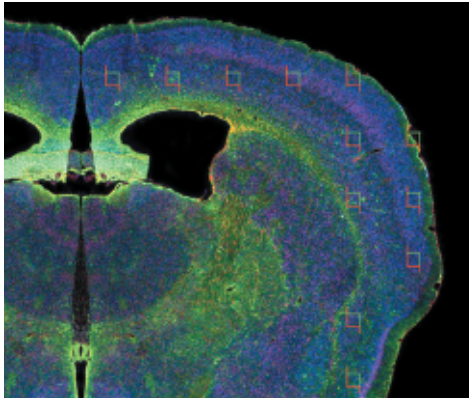
Fast: Spinning Disk system allows focusing, navigation and viewing of confocal images in real-time. Images are acquired much faster than conventional confocal systems.

Affordable: Cost-effective and affordable enough to be included in the individual researcher's lab.

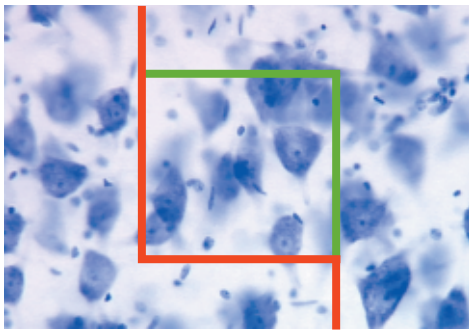
Multi-Purpose: Offers a wide range of morphological quantification methods in confocal, fluorescent, widefield, darkfield, DIC and brightfield in a single system.

Fully Integrated: Stereo Investigator Confocal Spinning Disk controls the stereological process and the entire microscope system, including XY stage, focus, shutters, filterwheels, and camera.

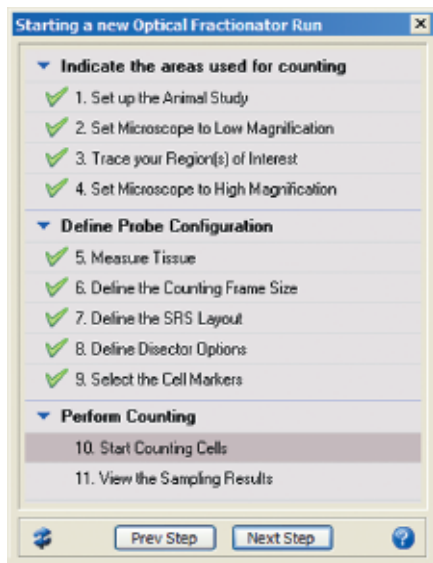




Systematic random sampling ensures unbiased location of sampling sites



This versatile system also supports brightfield and widefield fluorescence



The Workflow Window reduces training time by guiding the user through every step of the optical fractionator

SYSTEM FEATURES

- Fast, precise multi-channel fluorescent label quantification.
- Uses Olympus DSU configured with arc lamp illumination that covers the full spectrum (350-700nm), providing wavelength flexibility at a reasonable cost compared to laser illuminated systems.
- DSU hardware is directly controlled by the Stereo Investigator software.
- Exceptional image quality, comparable to images produced by line scanning laser confocal systems.
- Can be quickly switched between widefield and confocal modes.
- A spinning disk with a proprietary pattern reduces the amount of out-of-focus light reaching the detector.
- Easier to use and learn than conventional confocal systems.

Research Applications

- Ideally suited for counting biological particles like cells or synapses
- Analysis of volumes of biological particles
- Analysis of lengths of biological structures such as capillaries or axonal fibers
- Analysis of the spatial distribution of biological particles

Image Acquisition Features

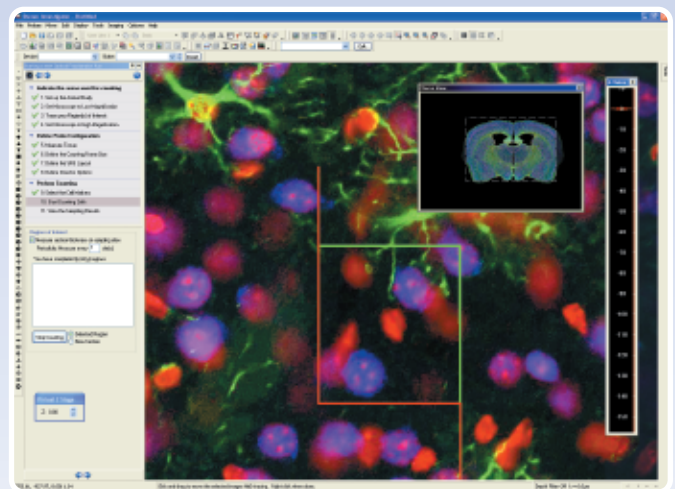
- Full software control allows automatic switching of filters, shutter control, microscope stage movement, z position, and camera control.
- Acquire multi-channel stacks of confocal images for archiving or offline analysis with stereology.
- Create large montages (virtual slides) of the entire specimen in confocal, fluorescent, or brightfield modes.

Support and Installation

MBF support service includes both technical support for your software and system as well as scientific application support to help you reach your research objective. We can provide you with a detailed quotation for a complete confocal system, including installation, setup, training and ongoing support.

Experience

MBF has been providing research solutions to the neuroscience community for over 18 years. For the last nine years, we have been delivering Stereo Investigator systems to research labs worldwide. Our stereology software has been cited in more scientific papers than any other stereology system. Leading researchers rely on Stereo Investigator to deliver quantitative results.



Stereo Investigator is fully integrated with the microscope system — including camera, stage, focus, shutter and filterwheel control

For more information,
visit www.mbfbioscience.com

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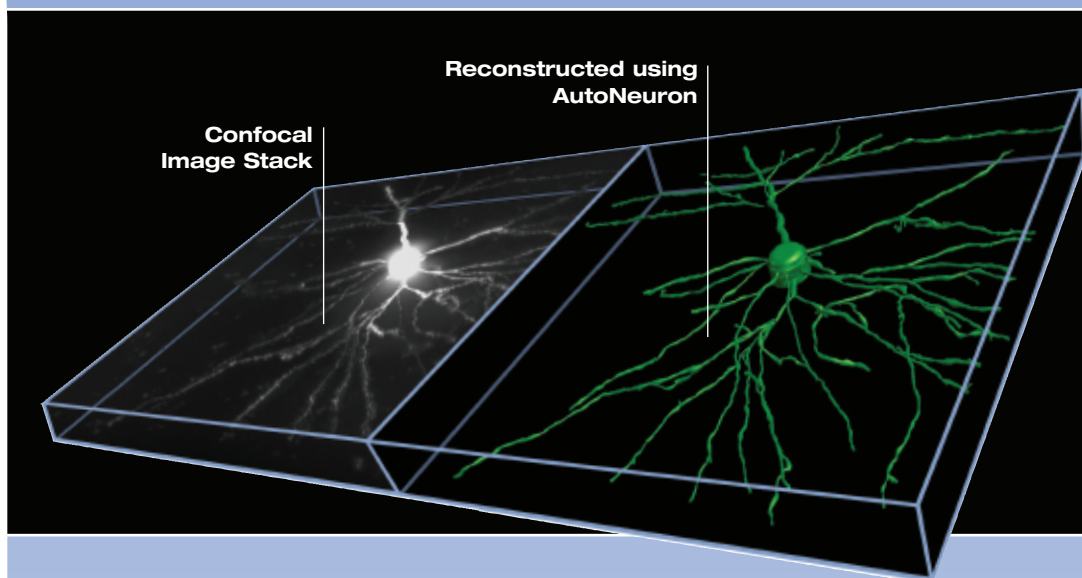


MicroBrightField, Inc.

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

AutoNeuron[®]

AUTOMATED NEURON 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 mor-

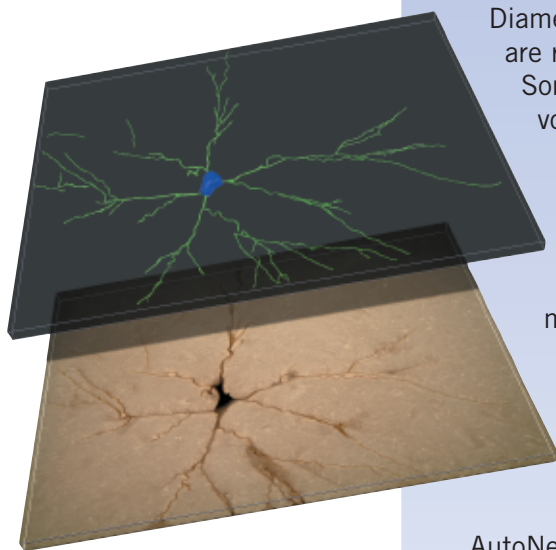
phometric analysis of complex branching structures. Quickly export results to standard document formats for publication.

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

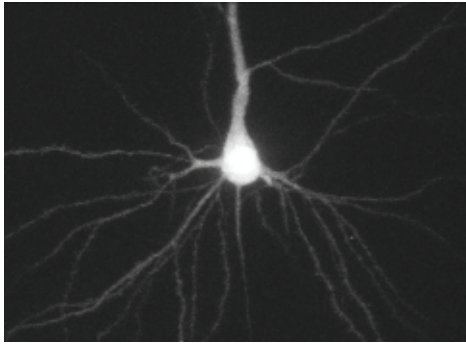
Proven Algorithm: AutoNeuron is patented technology based on more than ten years of published research in automated tracing of branching structures in biological tissue. MBF is the leader in analysis tools for neuroanatomical research. Hundreds of researchers trust our products for their research and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

Outstanding Customer Support:

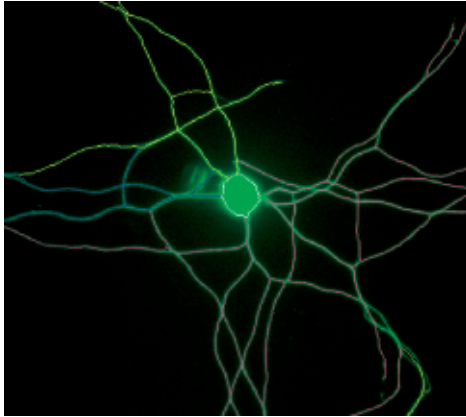
MBF has been successfully providing our expertise, training and support to the neuroscience community for two decades. Our Live Remote Control support is used to diagnose problems remotely and keep your system running smoothly.



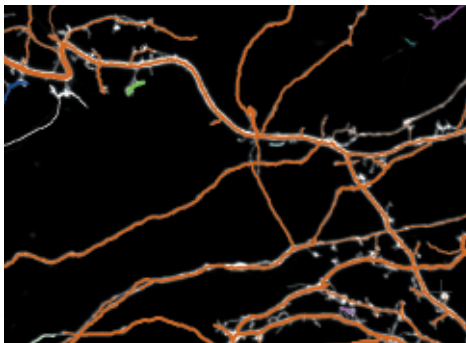
A brightfield 3D image with AutoNeuron reconstruction



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

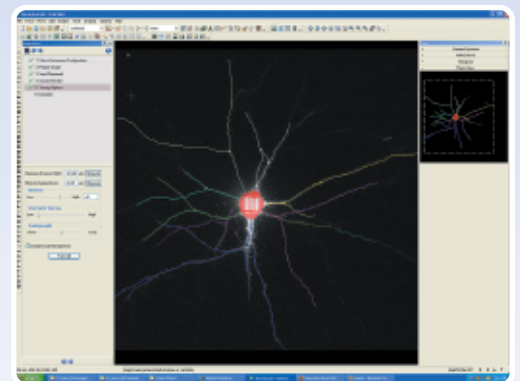
- Fully-editable output model
- Compatible with Neurolucida data format
- Generates 3D vector-based model
- Branches represented as tapered cylinders (conical frusta)
- Somas represented as contour sets
- Full branch length, order, volume, surface area analysis with Neurolucida Explorer
- Volume and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

Contact us to arrange a demonstration of AutoNeuron on your own neuronal images.

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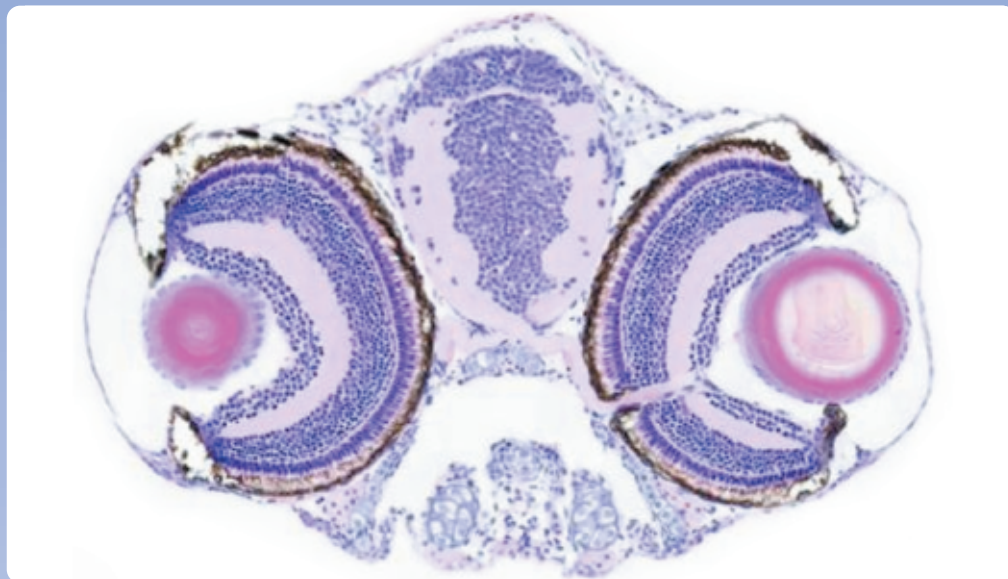
MicroBrightField, Inc.

**Comprehensive
system to
create, share
and view
virtual slides
for analysis,
collaboration
and publication**

Virtual Slice®

ADVANCED DIGITAL MICROSCOPY

FOR RESEARCH



BENEFITS OF USING VIRTUAL SLICE

Create extremely high-resolution montages composed of images obtained from multiple adjacent microscopic fields-of-view.

The Virtual Slice Module uses a motorized stage to automatically collect a series of contiguous images from a specimen and merge them into a single image montage.

Versatility

- Create virtual slides with any research microscope
- Image Viewer works with popular web browsers

Speed

- Automatically acquires adjacent fields of view into a seamless montage
- Rapidly view full slide images on the same computer, over a local network, or the internet
- Innovative viewer technology rapidly transmits the current field of view to the user. No extended waiting for images to download

True Microscope Views

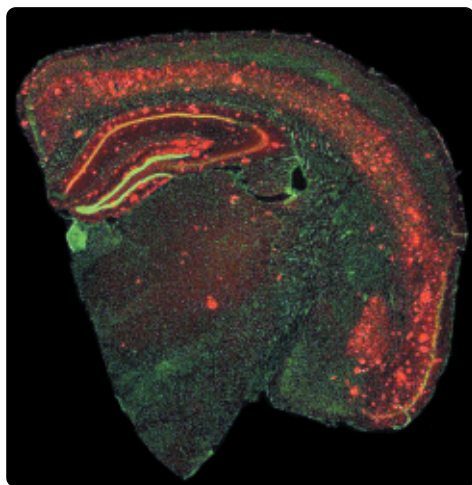
- Any field of view and multiple magnifications
- Dynamically pan and zoom

Annotate Slide Specimen Images

- Add text to the slide image to convey additional information
- Overlay arrows, contours, and flags to indicate regions of interest
- Link comments directly to fields of interest and indicate specific cells or structures easily
- Create high-resolution anatomical atlases

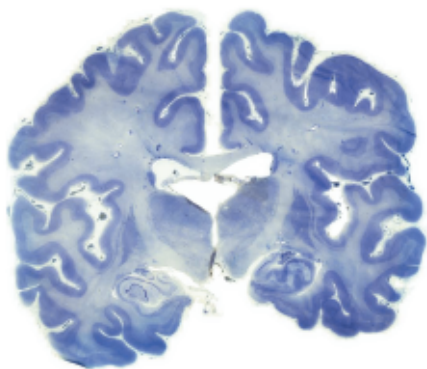
Makes Research Collaboration Easier

- Eliminates the need to ship valuable slides — no slides lost or damaged in transit
- Archive materials indefinitely — acquire images when staining is at optimal brightness
- Point to exact cells or structures for clearer communication
- Slides can be password protected to restrict access
- Any number of collaborators can view slides simultaneously for real-time consultation
- Perform quantitative analysis with NeuroLucida and Stereo Investigator over the web

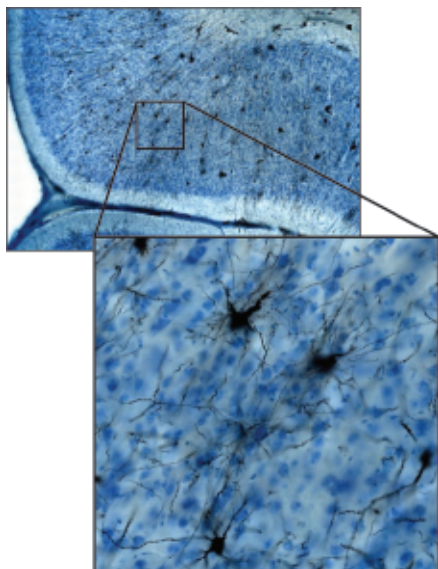


This virtual slide contains 9 levels of magnification and over 10,000 fields of view.

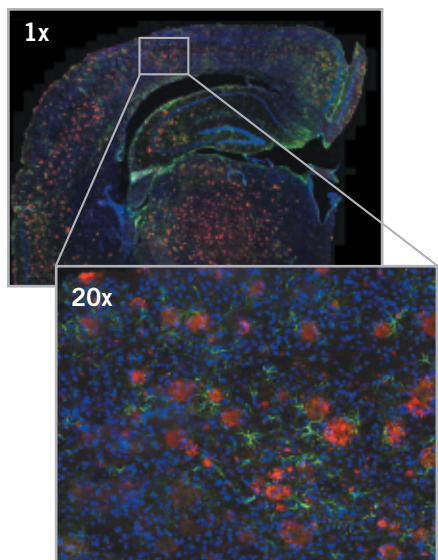
The image was acquired with a 60x objective lens.



Create virtual slides of large or small specimens using any microscope illumination modality



Indicate single cells for analysis and comparison



Create seamless montages for publication and presentations

VIRTUAL SLICE TECHNOLOGY

Virtual Slice technology allows remote viewers to examine slides with a functionality similar to that of a microscope; users can pan to regions of interest and zoom in and out freely. Advantages to virtual slides include remote access to slides, access to slides without a microscope, and the ability to see macro overviews of slides not attainable with a traditional microscope. A virtual slide stores multiple resolutions, from the

original source resolution of the microscope lens used for acquisition, down to a thumbnail view of the entire slide. The image information is stored in pyramidal format in multiple levels — a resolution level in the pyramid representing a different level of magnification. Each resolution level is divided into many small tiles. This enables navigating to any region of the slide at any magnification quickly.

SELECTED FEATURES

Acquisition:

- Acquire virtual slides with a research microscope using any objective lens
- Automatic stage movement for image acquisition
- Image alignment and stitching functions for seamless images
- Background correction for illumination irregularities
- Exclude regions to save scanning time

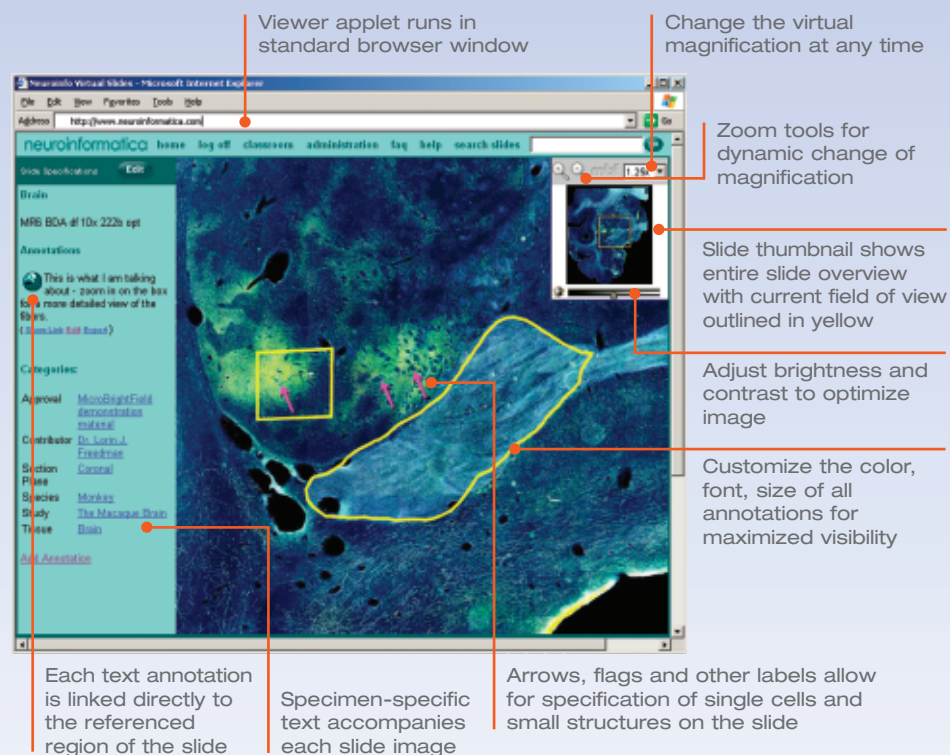
Viewer:

- Works with most Internet browsers
- Rapid image loading with standard Internet connection
- Serves only the requested field of view at requested resolution

- Show/hide overlay annotations and labels at selected magnifications
- Add unlimited informational text comments to each image
- Zoom in or out from annotated fields
- Change annotations at any time
- Color balancing and adjustment
- Scale bars and instant measurements

Neuroinfo Database:

- Store all images in a searchable database
- Flexible slide-searching capability
- All tracings, labels and text are stored linked to the slide
- Labels stored linked to slide location
- Export tracings, markers and images into NeuroLucida® or Stereo Investigator®
- Control access to slide sets with security features



For more information, visit www.mbfbioscience.com

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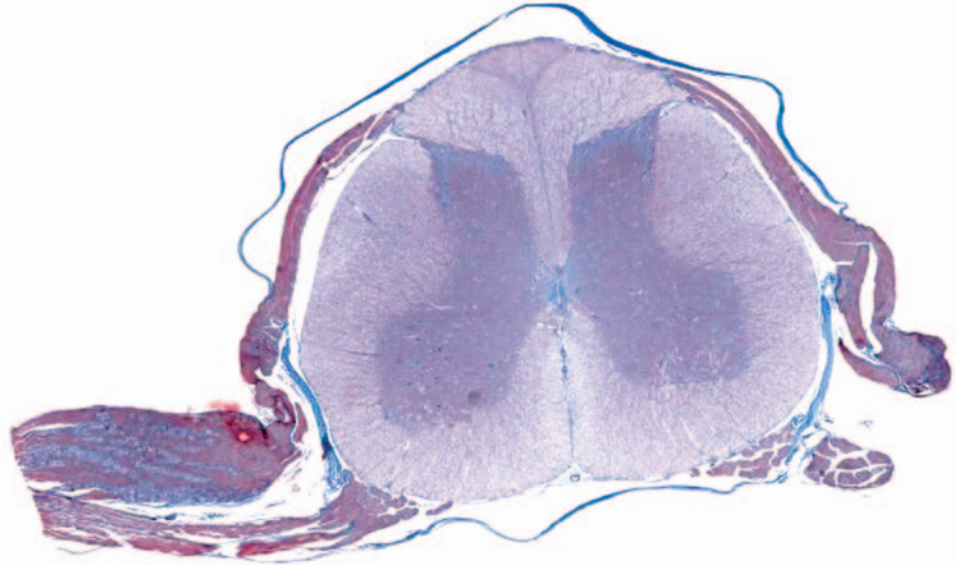


VIRTUALSLICE™

ADVANCED DIGITAL MICROSCOPY

FOR EDUCATION

Comprehensive system to create, share and teach with virtual slides using MBF's classroom setup



Virtual Slice Capabilities

Create Virtual Slides

- Create and share complete full resolution images of microscopic slides
- Rapidly acquire large seamless montages of entire slides

View Slides with microscope functionality over the Internet

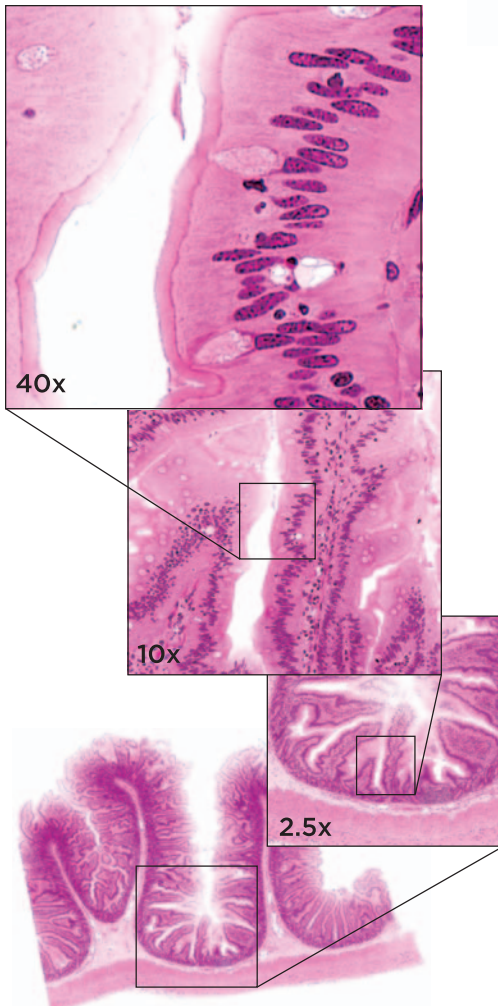
- Explore specimens with the zoom and pan functionality of a traditional microscope
- Use the Macro View slide overview to facilitate navigation
- View slides and study from any on-line computer
- Zoom dynamically from macro-view to highest magnification
- Fast interactive viewing in real-time

Attach meaningful information to slides

- Overlay labels including arrows, text, contours, flags, and markers
- Add unlimited informational text for display alongside the slide
- Link any text to specific regions or cells on the slide
- View slides with or without labels
- Create hyperlinks from slide regions to other web pages

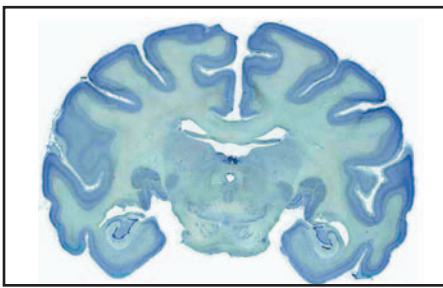
Classroom System

- Manage unlimited courses from a single virtual slide collection with our integrated organizational database
- Create curricula, courses, and individual lessons
- Add slide annotations specific to each course
- Create self-testing quizzes or graded exams
- Use student lists to control access to courses
- Password protect course access for security

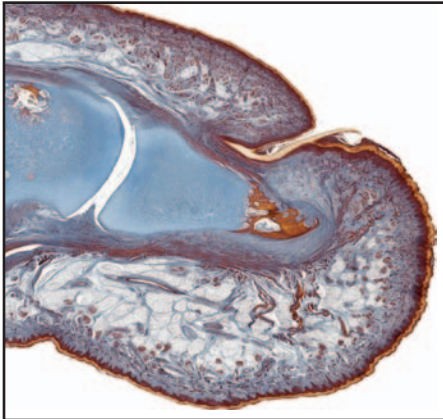


mbf BIOSCIENCE

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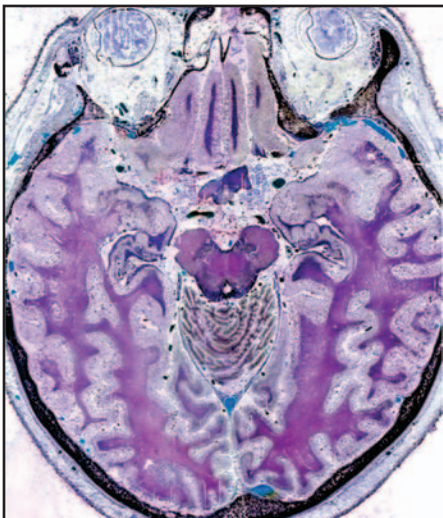
Complex structures made clear



Unusual specimens available to all students



Virtual Slice enhances basic histology



Give students access to the most rare materials (slide image courtesy the Visible Human Project)

The Virtual Slice System and accompanying Classroom system offer many benefits to instructors and students alike. Use cutting-edge technology to teach histology, pathology, and other life science.

Benefits of the Virtual Slice System

- Remote, 24-hour access to slide collections from any location
- Give students access to your best quality slide specimens
- Increase access to rare specimens and preparations
- Create effective and interactive teaching materials
- Reduce confusion by clearly labeling specific cells and structures
- Students can focus on learning structure before microscopy skills are mastered
- Student familiarity with navigation leads to faster learning of microscopy skills
- Add clarity to instruction by indicating any specific cell or region
- Reduce the expense of maintaining and replacing microscopes and slide sets
- Add slide material to taught online

Viewer applet runs in standard browser window

neuroinformatics home log off classroom administration faq help search slides

Slide Specifications Edit

Appendix

Annotations

Note the epithelium of the glands in the appendix is similar to that of the large intestine. Most of the epithelial cells are mucin; hence the light appearance of the apical cytoplasm (yellow arrows). The lamina propria is heavily infiltrated with lymphocytes, and the muscularis mucosae at the base of the glands is difficult to recognize (blue arrows). (Show Link Edit Export)

Cross section of an appendix from a preadolescent, showing the various structures composing its wall. A few of the Lymphatic Nodules are indicated (LN). Click button to see labels. (Show Link Edit Export)

This view reveals the submucosa in which the lymphatic nodules (LN) and... (Show Link Edit Export)

Lumen

Epithelium

Goblet Cells

muscularis mucosa

View or change the virtual magnification at any time

Zoom tools for dynamic change of magnification

Slide thumbnail shows entire slide overview with current field of view outlined in yellow.

User can adjust brightness and contrast to optimize image

Customize the color, font, size of all annotations for maximized visibility

Each text annotation is linked directly to the referenced region of the slide

Lesson-specific text accompanies each slide image

Arrows, flags and other labels allow for specification of single cells and small structures on the slide

Solutions

- Web-based using client server model
- CDs and DVDs for individual and institutional use
- Acquisition systems and slide scanning services

Visit www.microbrightfield.com for more information



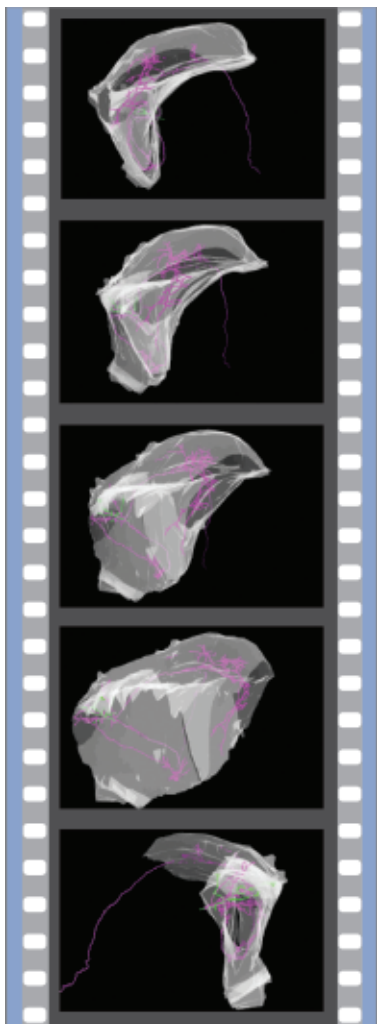
BIO SCIENCE

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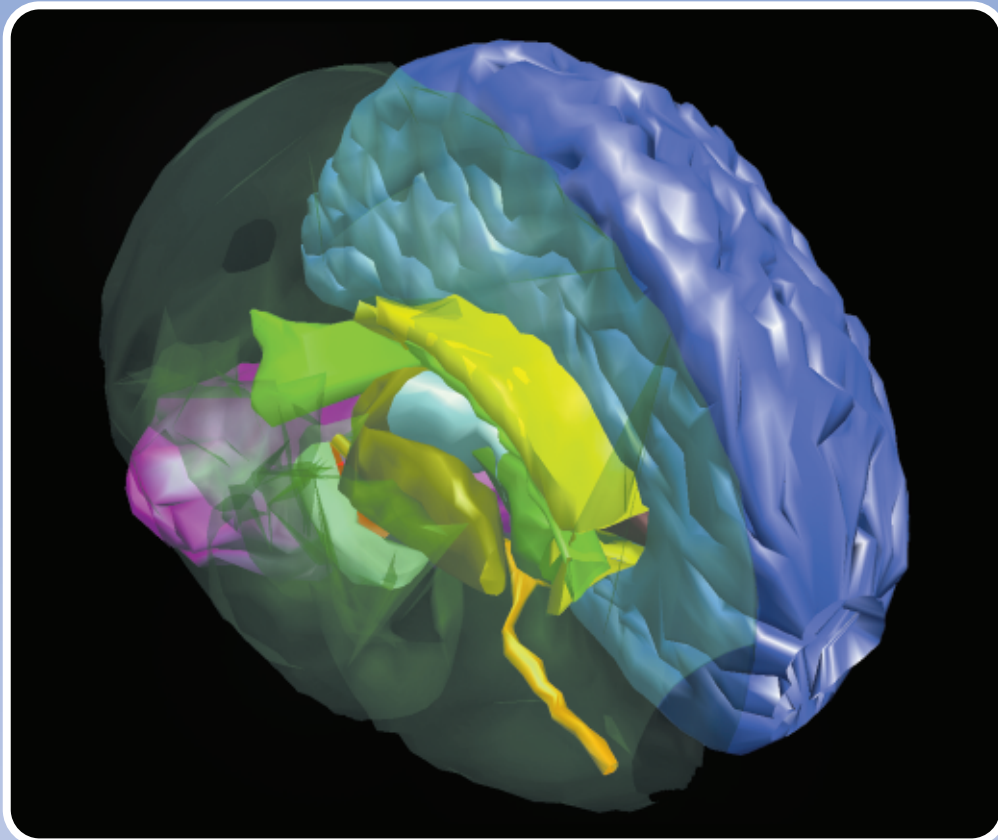
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Advanced 3D visualization tools



Solid Modeling

MODULE FOR NEUROLUCIDA® AND
STEREO INVESTIGATOR®



This software brings advanced 3D solid modeling graphics capabilities to neuroscientists. Using an innovative tessellation technology, the module takes a major leap beyond standard wire-frame graphic displays. Serial section reconstructions appear as solid objects that can be dynamically rotated to any angle, and resized to any magnification. Each structure contained within the reconstruction appears as if it had a solid surface. Neurons appear as solid 3-dimensional tapered structures*.

BENEFITS

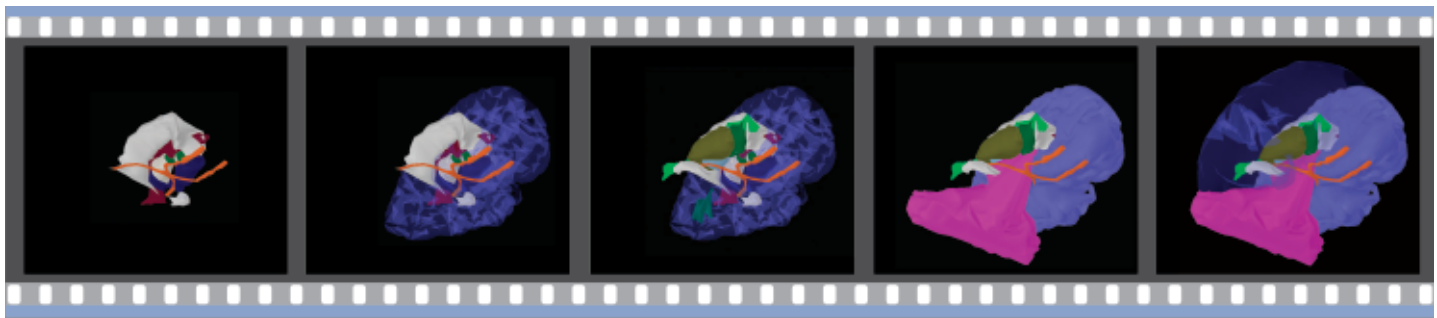
- Transform your serial section tracings into realistic solid models
- Create dramatic displays of neuronal structures*
- Communicate 3D information using state-of-the-art graphic techniques
- Rapidly generate publication-quality graphics and animations

SELECTED FEATURES

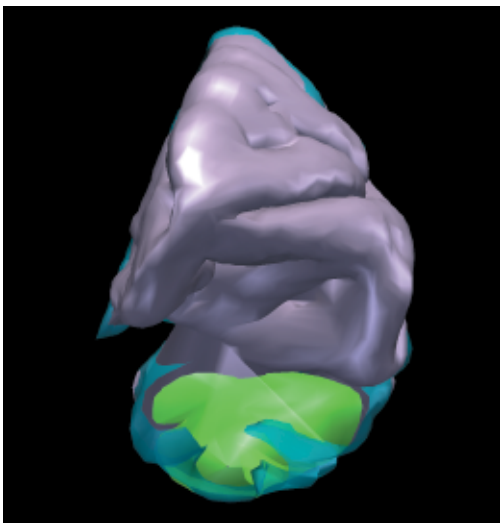
- Control transparency, lighting, color, perspective, depth cueing, and viewing position
- Dynamically rotate, zoom, and walk through the display
- Graphic “skin” overlaid on serial section outlines
- Create models containing both neurons and serial sections*
- Export 3D data to VRML files

*Requires Neurolucida software.

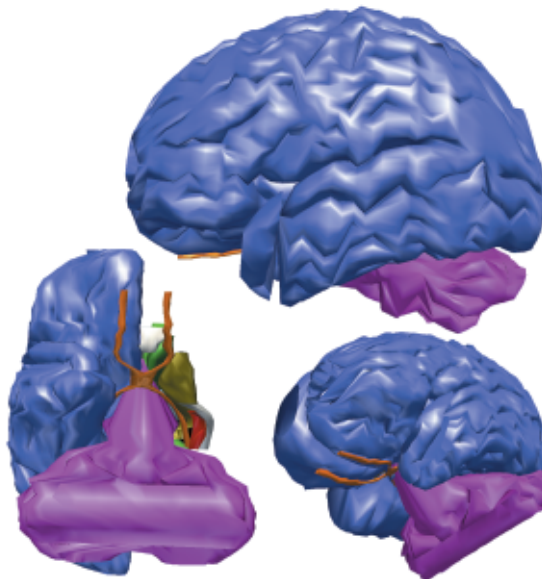
SOLID MODELING IMAGE GALLERY



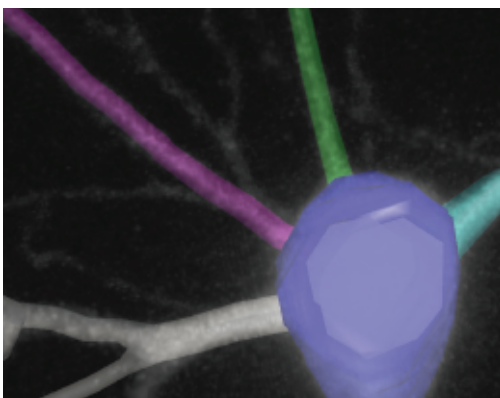
Selectively display and control the transparency of anatomical structures to reveal inner objects



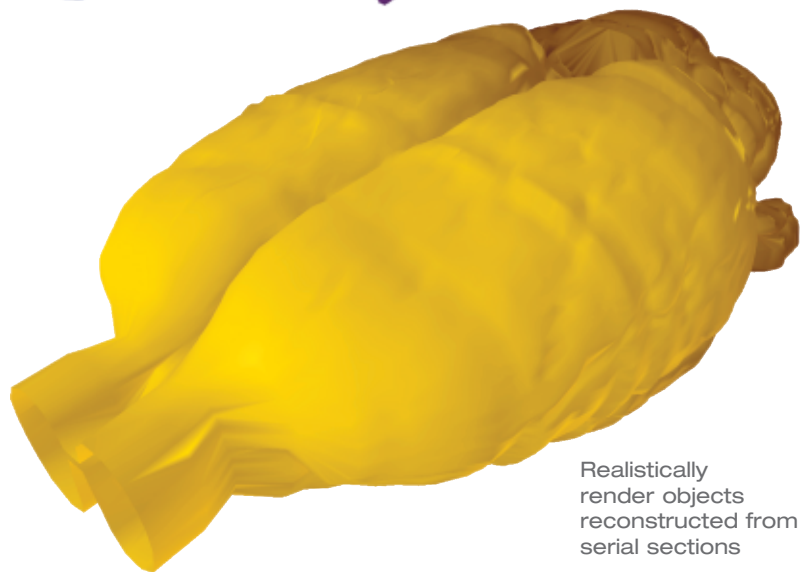
Use cutaways, lighting, and viewing options to create dramatic illustrations



Interactively rotate models to create movies and view objects from any angle



Use neuronal modeling to reveal structure and improve understanding of complex neuroanatomy



Realistically render objects reconstructed from serial sections

For more information about Solid Modeling,
visit www.mbfbioscience.com

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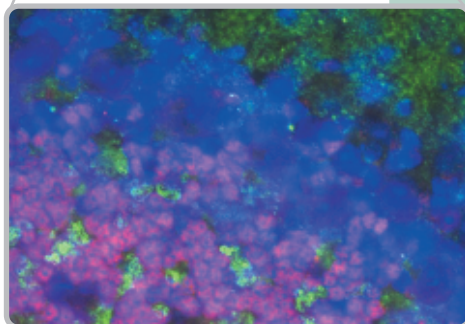
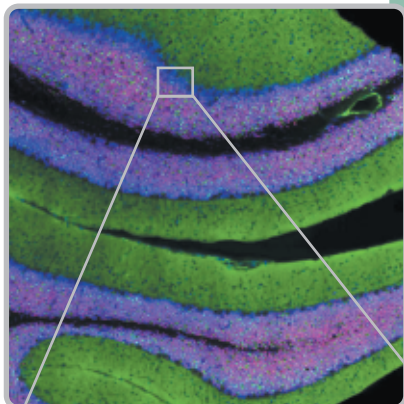


MicroBrightField, Inc.

Stereo Investigator[®]

PLUG-IN MODULES

Virtual Slice[®] Module



This software adds the capability of creating extremely high-resolution montages composed of images obtained from multiple adjacent microscopic fields-of-view. The Virtual Slice Module uses a motorized stage to automatically collect a series of contiguous images from a specimen and merge them into a single image montage. Automatic background correction is done to remove shading errors in order to obtain images with even illumination. The resulting montage is virtually seamless and easily exceeds the resolution and the field size of photomicrographic images. Virtual Slice removes the limitation of working from a single field-of-view, opening the doors to numerous new visualization and analysis possibilities. If you already own Stereo Investigator, the Virtual Slice Module can add significant new capabilities to your system investment.

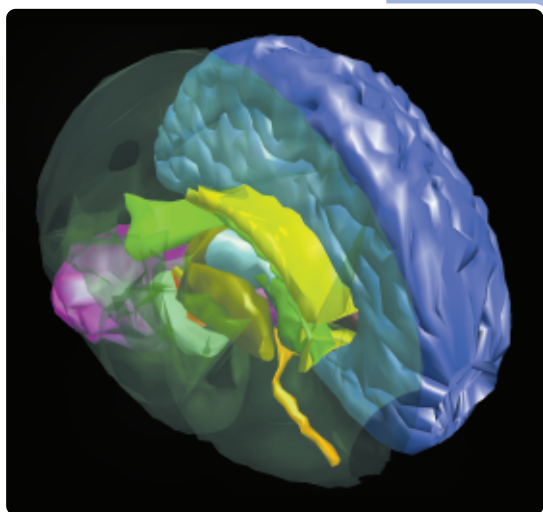
BENEFITS

- Obtain extremely high-resolution virtual slides for sharing, printing, and archiving
- Collaborators and students can view virtual slides over the Internet
- Archive tissue samples stained with rapidly fading dyes
- Use stereological probes and analysis tools to quantify anatomical structures contained in the virtual slides

SELECTED FEATURES

- Create seamless, high-resolution image montages
- Multiple levels of magnification in a single composite image
- Supports brightfield and fluorescent image modalities
- Simplified navigation tools to quickly move anywhere on the slide
- Specify region of interest for acquisition or acquire the entire tissue section
- Save to multiple file formats (TIFF, JPEG, PFF, FPX)
- Share virtual slides over the Internet with optional MBF Virtual Slice Server
- View slides on your desktop computer with optional standalone MBF Virtual Slice Viewer

Solid Modeling Module



This module brings advanced 3D solid modeling graphics capabilities to neuroscientists. Using an innovative tessellation technology, the module takes a major leap beyond standard wire-frame graphic displays. Serial section reconstructions appear as solid objects that can be dynamically rotated to any angle, and resized to any magnification. Each structure contained within the reconstruction appears as a solid surface.

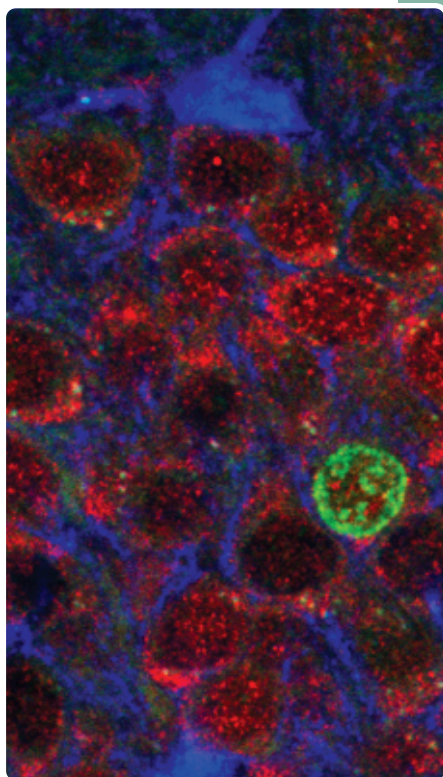
BENEFITS

- Convert your serial section tracings into realistic solid models
- Communicate 3D information with dramatic state-of-the-art graphic techniques
- Swiftly generate publication quality graphics and animations
- Obtain more realistic display of anatomical structures

SELECTED FEATURES

- Create 3D serial section reconstructions
- Full dynamic display of serial sections using Neurolucida Explorer's 3D graphics
- Morphometric and volumetric analysis via Neurolucida Explorer
- View data superimposed over the voxelized image
- Control transparency, lighting, color, and viewing position
- Interactively rotate, zoom, and walk through the display
- Graphic "skin" overlaid on serial section outlines
- Export 3D data to VRML files

Image Stack Module



This module adds the capability of acquiring image stacks (confocal, widefield, and brightfield) and analyzing the data. All of the features of the standard Stereo Investigator program are available when using the image stack module.

Focus through image stacks in real-time and execute 3D probes with ease. Analyze structures spread across multiple adjacent image stacks, breaking the “single stack boundary”. Use the Image Stack Module to collect image sets from your microscope for off-line analysis and to preserve sensitive fluorescent specimens.

If you currently view specimens with a confocal microscope, the Stereo Investigator Image Stack Module adds the quantitative dimension to your research.

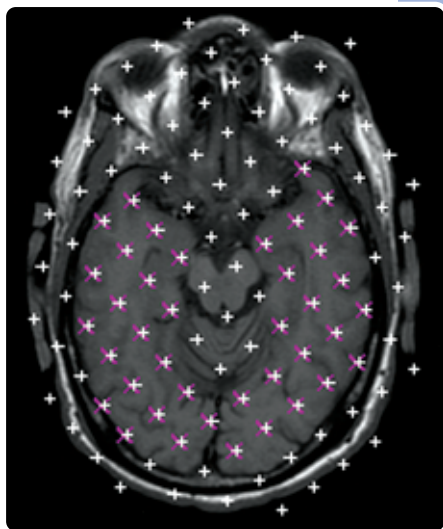
BENEFITS

- Analyze 3D confocal image stacks
- Perform detailed morphometric analysis on confocal specimens
- Generate 3D neuron reconstructions and analyses from confocal specimens
- Analyze structures spread across multiple image stacks

SELECTED FEATURES

- Spatially align multiple image stacks
- Merge separate color channels contained in multiple stacks
- All major confocal formats supported
- Automatically reads metadata included in the image stack
- Support for individual files sets as a stack (TIFF, JPEG, BMP, Zeiss LSM, Olympus Fluoview, Biorad PIC, or Leica TIFF file sets)
- Specify the exact focal distance between image planes
- Automatically tracks the depth coordinate (Z-axis) while you perform your analysis

MRI Module



This module adds the capability of analyzing data from MRI image sets. The MRI module reads image files in the ANALYZE format, DICOM format, as well as image sets comprised of a series of TIFF, JPEG, or BMP files. All of the capabilities of the standard Stereo Investigator program are available when using the MRI module.

Focus through an MRI image set in real-time and perform 3D volumetric analysis with ease. You may specify the exact distance between image planes. The module automatically keeps track of the Z-axis values while moving through the stack.

If you need to make morphometric measurements or use stereological

techniques on MRI image sets — the MRI Module adds the quantitative dimension to your research.

BENEFITS

- Use stereological methods to analyze 3D image sets obtained from MRI sources
- Perform detailed morphometric analysis on MRI image sets
- Generate 3D anatomical reconstructions and analyses

SELECTED FEATURES

- Support for individual files sets as an MRI set (TIFF, JPEG, BMP, ANALYZE or DICOM file sets)
- Specify the exact focal distance between image planes
- Module automatically tracks the Z-axis while you trace

For more information,
visit www.mbfbioscience.com

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Neurolucida[®]

PLUG-IN MODULES

Virtual Slice[®] Module

This software adds the capability of creating extremely high-resolution montages composed of images obtained from multiple adjacent microscopic fields-of-view. The Virtual Slice Module uses a motorized stage to automatically collect a series of contiguous images from a specimen and merge them into a single image montage. Automatic background correction is done to remove shading errors in order to obtain images with even illumination. The resulting montage is virtually seamless and easily exceeds the resolution and the field size of photomicrographic images. Virtual Slice removes the limitation of working from a single field-of-view, opening the doors to numerous new visualization and analysis possibilities. If you already own Neurolucida, the Virtual Slice Module can add significant new capabilities to your system investment.

BENEFITS

- Obtain extremely high-resolution virtual slides for sharing, printing, and archiving
- Collaborators can view virtual slides over the Internet
- Archive tissue samples stained with rapidly fading dyes
- Use Neurolucida to analyze anatomical structures contained in the virtual slides

SELECTED FEATURES

- Create seamless, high-resolution image montages
- Use any objective lens to acquire image
- Multiple levels of magnification in a single composite image
- Supports brightfield and fluorescent image modalities
- Simplified navigation tools to quickly move anywhere in the slide
- Specify region of interest for acquisition or acquire the entire tissue section
- Save to multiple file formats (TIFF, JPEG, PFF, FPX)
- Share virtual slides over the Internet with optional MBF Virtual Slice Server
- View slides on your desktop computer with optional standalone MBF Virtual Slice Viewer

Solid Modeling Module

This module brings advanced 3D solid modeling graphics capabilities to neuroscientists. Using an innovative tessellation technology, the module takes a major leap beyond standard wire-frame graphic displays. Serial section reconstructions appear as solid objects that can be dynamically rotated to any angle, and resized to any magnification. Each structure contained within the reconstruction appears as a solid surface.

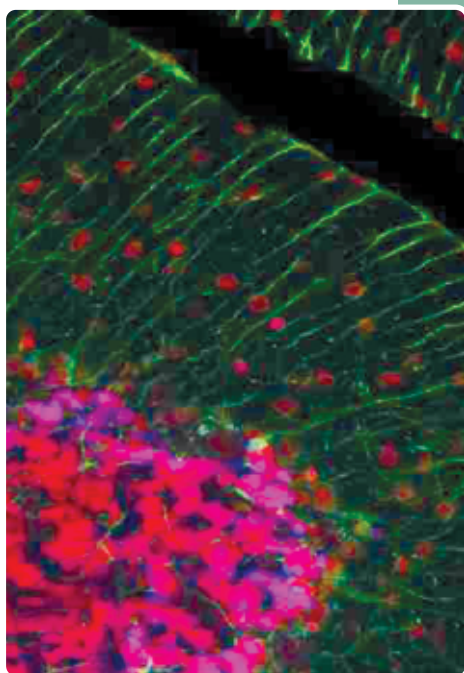
BENEFITS

- Convert your serial section tracings and neuron reconstructions into realistic solid models
- Communicate 3D information with dramatic state-of-the-art graphic techniques
- Swiftly generate publication quality graphics and animations
- Obtain more realistic display of neuronal structures

SELECTED FEATURES

- Control transparency, lighting, color, and viewing position
- Interactively rotate, zoom, and pan
- Graphic "skin" overlaid on serial section outlines
- Neuronal processes rendered as tapered cylinders
- Export 3D data to VRML files
- Marker symbols float to always face the viewer
- View data superimposed over the voxelized image

Image Stack Module



This module adds the capability of acquiring image stacks (confocal, widefield, and brightfield) and analyzing the data. All of the features of the standard Neurolucida program are available when using the image stack module.

Focus through image stacks in real-time and perform 3D reconstruction with ease. Trace and analyze structures spread across multiple adjacent image stacks, breaking the “single stack boundary”. Multiple stacks can be dynamically aligned and registered to produce a composite 3D montage. Image processing functions are available to improve clarity and visibility. The number of images in a stack is limited only by available computer memory.

If you currently view specimens with a confocal microscope — even difficult to analyze structures such as neurons,

nerve fibers, or capillaries — the Image Stack Module will add a quantitative dimension to your research.

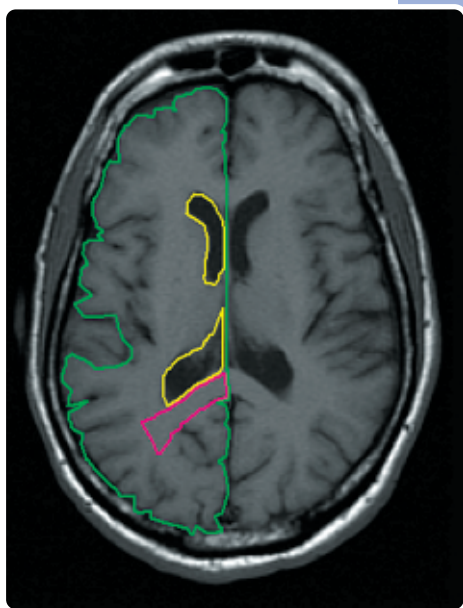
BENEFITS

- Analyze 3D image stacks
- Perform detailed morphometric analysis on confocal specimens
- Generate 3D neuron reconstructions and analyses from confocal specimens
- Analyze structures spread across multiple image stacks

SELECTED FEATURES

- Spatially align multiple image stacks
- Merge separate color channels contained in multiple stacks
- Filter individual color channels for display
- All major confocal formats supported
- Automatically reads meta-data included in the image stack
- Support for individual files sets as a stack (TIFF, JPEG, BMP, Zeiss LSM, Olympus Fluoview, Biorad PIC, or Leica TIFF file sets)
- Specify the exact focal distance between image planes
- Module automatically tracks the depth coordinate (Z-axis) while you trace

MRI Module



This module adds the capability of analyzing data from MRI image sets. The MRI module reads image files in the ANALYZE format, DICOM format, as well as image sets comprised of a series of TIFF, JPEG, or BMP files. All of the capabilities of the standard Neurolucida program are available when using the MRI module.

Focus through an MRI image set in real-time and perform 3D reconstruction with ease. You may specify the exact distance between image planes. The module automatically keeps track of the Z-axis values while you trace.

If you need to make morphometric measurements or to use stereological techniques on MRI image sets — the MRI Module will add a quantitative dimension to your research.

BENEFITS

- Analyze 3D image sets obtained from MRI sources
- Perform detailed morphometric analysis on MRI image sets
- Generate 3D anatomical reconstructions and analyses

SELECTED FEATURES

- Support for individual files sets as an MRI set (TIFF, JPEG, BMP, ANALYZE or DICOM file sets)
- Specify the exact focal distance between image planes
- Module automatically tracks the Z-axis while you trace

For more information,
visit www.mbfbioscience.com

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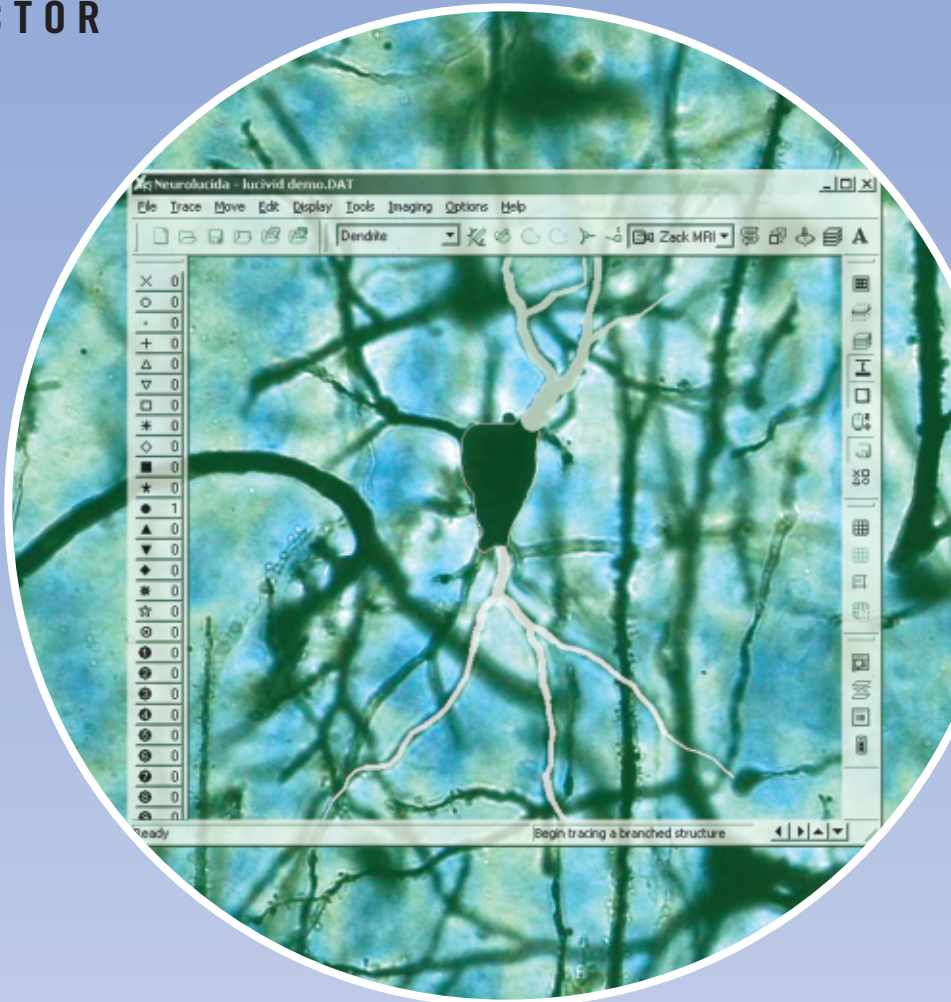


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**View your
computer
display through
the oculars,
superimposed
on the optical
image**

Lucivid™

MICROSCOPY IMAGE INJECTOR



LUCIVID

is an innovative microscope attachment containing a miniature CRT which projects the display from a computer into the optical path of a microscope. Experience the unmatched optical quality of working with a direct view of the specimen, fully integrated with the MBF analysis software display.





Lucivid microscopy image injector unit

LUCIVID BENEFITS

Improve your analysis and measurement capabilities by working directly with the microscope optical image, free from the resolution limitations of camera-based imaging systems.

Ideal for retinal stimulation experiments that project computer generated stimulus patterns through the objective lens on to a specimen.

Analyze microscopic slide specimens

using the highest resolution and best optical clarity.

Ergonomic work environment using the computer's mouse and traditional microscope viewing position.

Achieve maximum versatility by setting up an MBF system to use with either a Lucivid or video camera or both, depending on the tissue being examined.

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SPECIFICATIONS

Input Voltage:	90-240 VAC
Input Power:	37 watts
Input Connectors:	15-pin high density VGA for PC and Macintosh BNC for RS170, RS170A, and RS343A video
Input Signal:	Resolutions: 640x480 through 1024x768 Horizontal Frequency Range: 12 kHz to 50 kHz Vertical Frequency Range: 56Hz to 70 Hz
Output Connectors:	15-pin high density VGA and BNC
Controls:	Power, Brightness, Contrast, Vertical Size, Horizontal Size, Vertical Position, Horizontal Position, Focus
Electronics Enclosure:	6"x3 1/2" x 10"
CRT Size:	1" diameter x 6 1/4" length
CRT Cable:	36"
Geometric Distortion:	+/- 2%
Luminance:	400 fl. minimum

APPLICATIONS

- Computer microscopy
- Retinal stimulation
- Clinical pathology
- Brain mapping
- Neuron tracing
- Stereology
- General morphometry
- Computer controlled inspection
- Biological and medical research
- Materials science
- Quality control
- Semi-conductor inspection

FEATURES

- Accurately overlays graphics or text onto the microscope image
- High brightness
- High linearity
- High resolution
- Does not interfere with the normal use of a microscope
- Easy to install on most biological and industrial microscopes
- Uses MBF patented technology
- Windows and Macintosh compatible
- Adjustable brightness, contrast size, aspect ratio, and centering
- Ideally suited for brain mapping, morphometry, neuron tracing, and stereology when used with MBF Neurolucida® or Stereo Investigator® software



MBF is an authorized reseller of Dell computers, which we can integrate with the Lucivid system and your research microscope system.

For more information about Lucivid, visit www.mbfbioscience.com

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