FilamentTracer is fully integrated with Imaris, enabling users to leverage its impressive range of 3D and 4D visualization capabilities as well as its image editing and processing and analysis functions all in one window. The ideal combination for FilamentTracer is Imaris MeasurementPro for measurement of distance, volume and intensity changes. When combined with ImarisTrack, the FilamentTracer becomes a tool for detection and analysis of temporal changes in length and volume of developing spines and dendrites caused by developmental and environmental factors. Together with Imaris XT it can be taken even further and spines can be classified by diameter, size, shape or any other parameter that is calculated by FilamentTracer.

Main Image: A GFP-labeled neuron traced and visualized in FilamentTracer highlighting several classes of dendritic spines (purple, blue and yellow) color-coded by Spine Classifier XTension in ImarisXT. Image courtesy of Miso Mitkovski at MPI-em Goettingen.

Left Top: A 3D image of Purkinje cell visualized with Easy3D projection in Imaris prior to tracing and segmentation analysis.
Left Bottom: The same cell traced in FilamentTracer and rendered to display dendritic filaments and numerous smaller dendritic spines protruding from main filaments. Images courtesy of Yvonne Clarkson and Mandy Jackson at the University of Edinburgh.

Detect, visualize and measure neurons’ dendritic trees, axons, spines and microtubules. FilamentTracer is the most advanced software product for the automatic detection of filamentous structures in 2D, 3D and 4D
FilamentTracer
The Intelligent Way to Visualize and Measure Filamentous Structures

Your Benefits
Increase accuracy of visualization and measurement for all kinds of filamentous components of your specimen.

Save time by automatically detecting and segmenting theses structures.

Retain full control over the automatic filament detection process (i.e. start and mid points, diameter, max gap between disconnected filaments).

Filament Detection
- Segmentation based on connectivity and intensity.
- Dynamic control over the maximum gap allowed between disconnected filament segments.
- AutoNetwork tracing mode maps out the connectivity network and allows for rapid and time-saving changes of traces.
- Waypoints for filament tracing through specified key locations

Visualization
- Visualize filaments using any of the Imaris surpass objects to show surrounding cellular or tissue components and superimpose filaments over the original volume rendering.
- Display filaments as lines or constant-width cylinders or real-diameter cylinders (showing the actual diameter measured from the structure).
- Create advanced and informative key-frame animations and movies for your presentations.

Interaction / Editing
- Selection and modification of individual segments, entire branches or single points as well as loops or segments based on sizes. Automatically select loops and smaller branches.
- Filament processing – manual and automatic merging, splitting, smoothing of filaments and segments.
- Selection processing – traced components can be deleted, joined and centered or have their diameters matched to the original data.
- Classifications – define segments as dendrites or spines, classify them as distinct points (e.g. branching points) and combine with ImarisXT spine classifier.

Measurements
- Statistical values – including neuroscience-specific dendrite thickness and volume, spine length and density, branch level, Scholl analysis as well as other, non-neuroscience statistics.
- Analyze filaments in 3D-time (4D) - examine changes over time with ImarisTrack in any statistical parameter calculated.
- Filtering and classifying of individual objects or object groups with Imaris MeasurementPro and ImarisXT.
- Data export - filament statistics on branch points and segments can be exported as .csv, Excel .xml or native Excel .xls files or to selected modelling programs (neuron).

Software requirements
FilamentTracer requires Imaris and Imaris MeasurementPro for statistical output. ImarisTrack is required for tracking filament objects in 4D and ImarisXT can be added for customer-specific analyses and classifications involving MatLab scripts.

Operating system requirement
FilamentTracer runs on PCs with Microsoft® Windows® XP, Vista, 7 (32 and 64-bit) and MacOS (10.6 or later).

Windows systems - we recommend using 64-bit OS with 16GB RAM, 3.3 GHz (or faster) quad-core CPU and 64-bit support.

Mac systems – we recommend using Intel 2.8 GHz (or faster) quad-core CPU and 16GB RAM

Graphics boards - ATI/ nVidia graphics card with 512 MB RAM. For full list of supported hardware please visit bitplane.com/go/support/system-requirements.

Construction
The creation wizard helps choosing the optimal parameters for the automatic filament detection. During this selection process all modules of Imaris and Surpass are available as a preview for intermediate results.

Control and Quality
Use the powerful creation wizards to correctly detect filamentous structures, even when the image quality is sub-optimal. Use the “Remove Disconnected Segments” option to dynamically improve the quality of your automated detection analysis protocol.

Software requirements
Email us at: welcome@bitplane.com
bitplane.com

Email: ussales@bitplane.com
Tel: 1 (860) 290-9211
CT 06074, USA
Suite #3, South Windsor
425 Sullivan Avenue
America

Email: sales@bitplane.com
Fax: +41 1 430 11 01
Phone: +41 1 430 11 00
Email: sales@bitplane.com

International

Bitplane AG
Badenerstrasse 662
CH-8048 Zürich

Lymph node visualized in FilamentTracer. Vessels (red) have been traced to give insights into the filamentous network while B-cell follicles (green) were detected with Surfaces.

Tracing the meshwork of filaments. Myelin is seen here labelled green and partly overlapping with the neuronal processes (red). Image courtesy of Denise Fitzgerald and Craig Ledgerwood from the Johnston group at Queens University Belfast.

Email: ussales@bitplane.com
Tel: 1 (860) 290-9211
CT 06074, USA
Suite #3, South Windsor
425 Sullivan Avenue