Amira

3D/4D+ visualization and analysis software for cell biology

Amira provides a comprehensive array of tools for the flexible and accurate analysis of time series data of cellular processes. It enables researchers to perform dedicated segmentation workflows on their intra- and intercellular images and apply powerful automated object tracking.

Single cell and single particle tracking

Using powerful, high-speed light-sheet microscopy, researchers are now able to image inter- and intra-cellular processes at higher speeds and with greater field of views. This new technology allows gaining a better understanding of development processes and disease progression at the cellular level.

With Amira, researchers are now able to deploy custom segmentation algorithms to find individual cells or particles in 3D time series data. These segmented objects can then be tracked using Amira's automated tracking solution (powered by u-track 3D, under submission for peer-review from the Danuser Lab):

· Automatic selection of the motion model

· Automatic event detection

· Automatic gap closing

The tracks can then be analyzed to measure parameters such as:

· Motility and diffusion

· Direction and distance

· Mode of motion

· Cell lineage

· Morphology and shape*

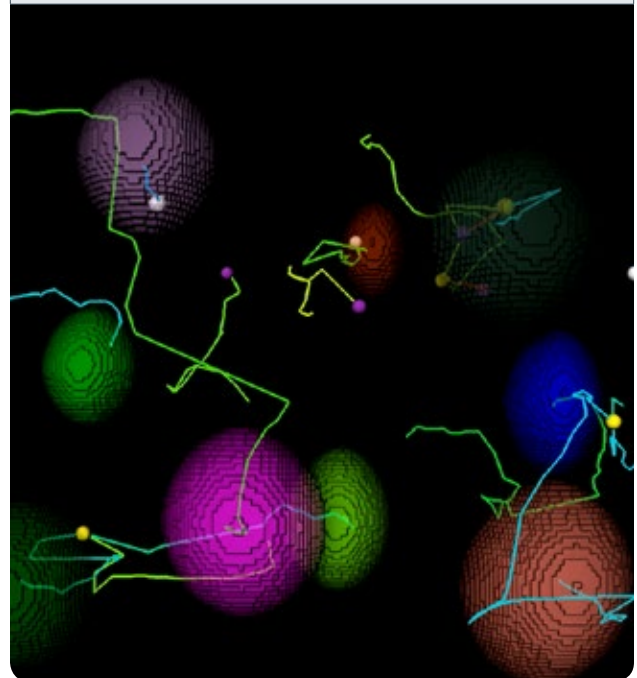· Activity/intensity/marker concentration*

Coming soon with Amira 6.4

| KEY BENEFITS |
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| Custom workflows on time series to address your segmentation/detection task |
| Automatic object tracking for thousands of fast moving objects |
| Full CLEM support with multi-volume architecture |
| Accurate tracing of thousands of densely packed filaments |

↑ Images collected with TLS-SPIM, Liang Gao lab, Stony Brook University.

Filament tracing and editing

Analysis of filaments and microtubules is of great interest when studying intracellular processes, composition of cellular structure, and cell migration. Studying these cellular structures will lead to the development of disease treatments.

With Amira, researchers are able to:

- Automatically detect and trace fine filaments in noisy Cryo-EM or DualBeam™ data
- Reconstruct filamentous networks
- Edit filament graphs
- Perform quantitative analysis of filament graphs
- Generate compelling 3D renderings

Index: 4216
Length: 591 NM
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Elevation: 65°
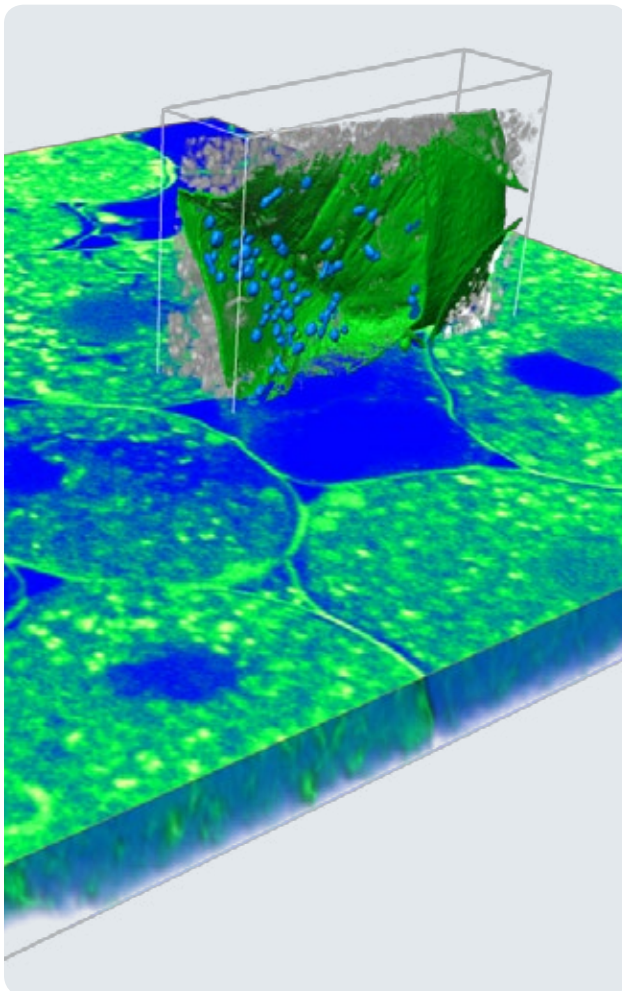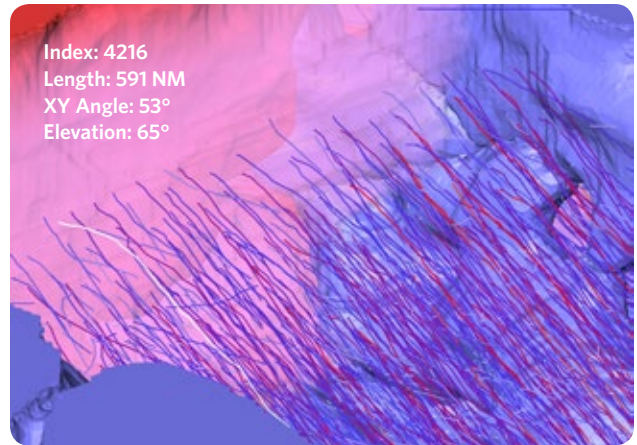
↑ Data courtesy of Dr. Miriam Lukas, EMEZ, ETHZ Zürich

Correlative Light and Electron Microscopy (CLEM)

The main challenge in CLEM workflows appears during the sample preparation and image acquisition. The resulting multi-channel time series data then needs to be correlated.

Amira is the tool of choice for many researchers working with multi-modal data. Amira's architecture offers:

- Multi-volume data processing and visualization
- Automatic and interactive registration tools
- Multi-Planar Workroom offers a user-friendly interface for image registration and fusion

Whatever the experimental challenges that CLEM researchers have to overcome, Amira is ready for their data.

Data import

With the large variety of imaging techniques available to study inter- and intracellular processes, scientists are often confronted with image equipment from various vendors all preferring their own proprietary file format.

Amira makes import of data easy through the integration of Bio-Formats:

- Conveniently load 3D or 4D+ data from over 140 file formats
- Immediately work with your data in a single application without import/export hassle

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FEI™