arivis

Imaging Science

IMAGE ANALYSIS WHICH FITS YOUR DATA

Vision4D

arivis **Vision4D** is the leading software for exploring and analysing large multi-dimensional image datasets created by confocal, Light Sheet, Multi-Photon or Electron Microscopy. arivis **Vision4D** can handle several hundred Gigabytes or terabytes of such image data as easily as if the were just a few megabytes in size.

VISUALIZATION & ANALYSIS

With our state-of-the-art Direct Volume Rendering techniques and the efficient use of system resources based on our **Image Core**, arivis **Vision4D** provides a great user experience when handling very large image data even on regular consumer hardware. The easy to use and interactive user interface together with the fast and flexible rendering engine makes it easy to reveal interesting and fine structures, even in large or complex data sets. Viewing samples with synchronised clipping planes, projections and 4D rendering can help to understand structure and function much better and faster.

For quantification of 3D image data the arivis Analysis Pipeline offers a robust and flexible click-and-play solution for processing and quantification of any kind of 2D, 3D or 4D microscopy images. Our pipeline concept enables the novice user to quickly run a pre-existing or newly built analysis application, while the image analysis expert is still empowered to create complex analysis routines and share it with their colleague. The analysis strategy and iterative approach of arivis **Vision4D** allows image processing and segmentation of a small field of view, a 3D/4D subset or the complete data set.

Ready for the Future with Machine Learning

- Light Sheet Microscopy
- Confocal Microscopy
- Multi Photon Microscopy
- Widefield/Deconvolved
- Electron Microscopy
- Computer Tomography/MRT
- X-Ray Microscopy

BIG IMAGE DATA
TB READY
Powered by arivis ImageCore Technology

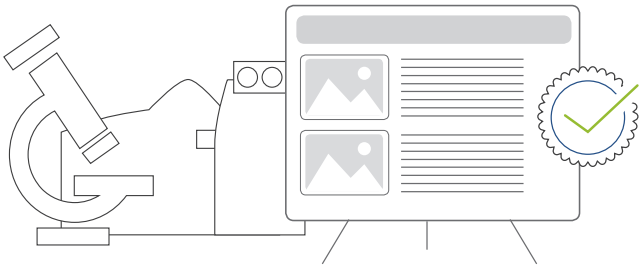
- Cell Biology
- Developmental Biology
- Cancer Research
- Neuroscience
- Immunology
- Translational Research
- Physiology

The arivis **ImageCore** is a powerful software library which allows redundancy-free storage. This technology provides random access to any area of the image at any zoom level in almost instant time

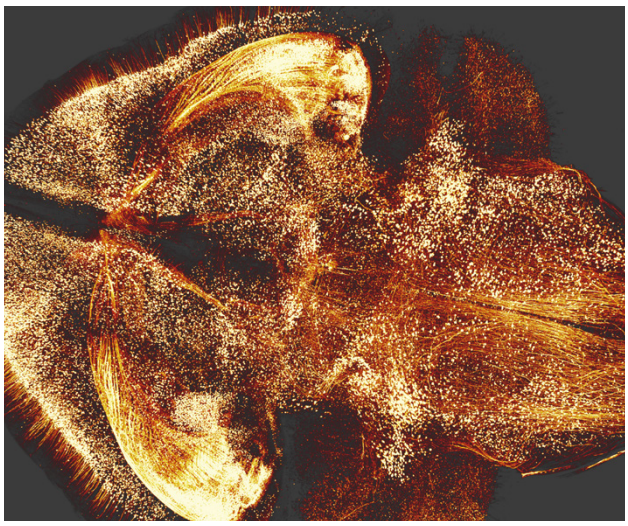
High quality Visualization of large image data

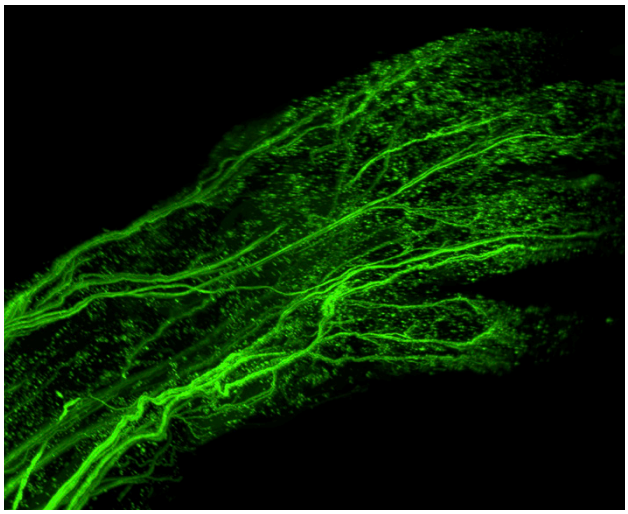
The modularity of the software allows the addition of further image processing and analysis functions step by step to accommodate your changing requirements if needed. arivis **Vision4D** supports more than 30 file formats from a variety of providers in various fields of imaging. The supreme quality of rendering and the easy creation of movies enable a perfect presentation and publication of large and complex image data. The fully interactive tools for rendering, lighting and opacity settings allow effective rendering of even faint structures and detail which may be otherwise hidden in your data. The Personal **WebView** function allows users to share large 2D/3D image sets without the need to copy data beforehand or for collaborators to own a license.

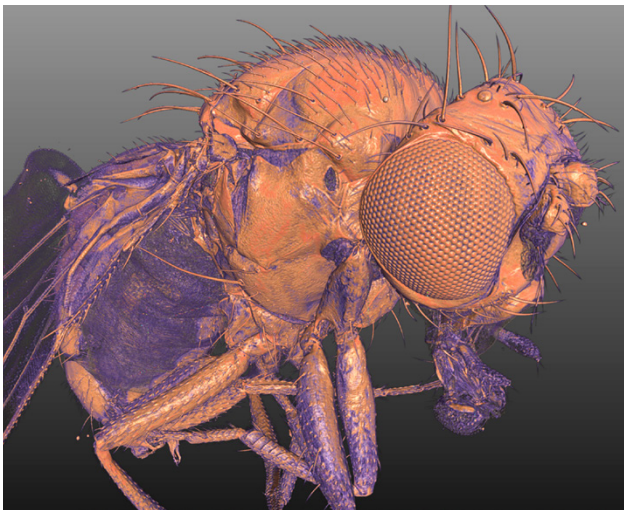
arivis **Vision4D** Visualization - Highlights



- Explore files of virtually unlimited size and dimensions with ease
- Advanced colouring and display options to highlight even hidden and fine structures
- Fast and Interactive 4D navigation with flexible rendering options
- Bookmarks, history and undo functions for additional freedom in exploration
- Easy creation of high quality movies with thumbnails
- Synchronized Split View for simultaneous visualization of 2D/3D View
- Versatile Tile and Stitch functionality in 2D and 3D
- Image transformation: cropping, resampling, rotation and more
- Python scripting for extensive customisation
- Personal WebView for team collaboration to shore large 2D/3D images without copying
- Option for modular upgrade to advanced quantification and analysis functions







Bootom Left: vDisco technology, Ertürk Lab, **Top Left:** Ertuerk Lab, LMU München, vDISCO project from Cai and Pan et al., method of clearing and staining: vDISCO **Right:** Drosophila, Anne Weston, EM STP, Francis Crick Institute, UK. High resolution rendering by arivis

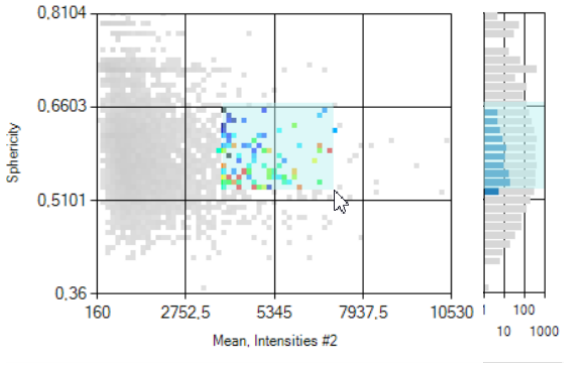
Modular Interactive Analysis and quantification of image data

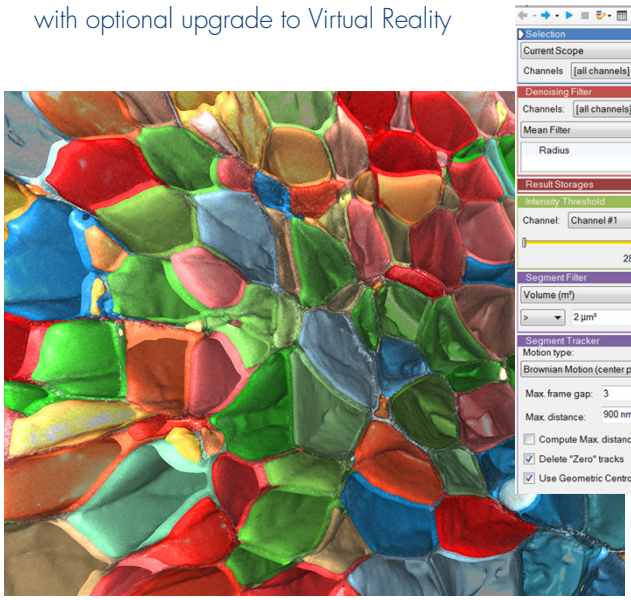
Start your image anaylsis today, even if you are not an image analysis expert or programmer. Using the flexible Analysis Pipeline novices can start with predefined easy to use pipeline for common use cases, while experts may combine different operators for, denoising, segmentation, filtering and other analysis tasks in a clear pipeline with an interactive preview. Analysis results can be reviewed in synchronized split view windows in 2D and 3D view simultaneously. Especially helpful for densely packed structures and for tracking experiments. The integrated Machine Learning functionality allows the segmentation of even difficult samples easily and without deep knowledge of image analysis techniques.

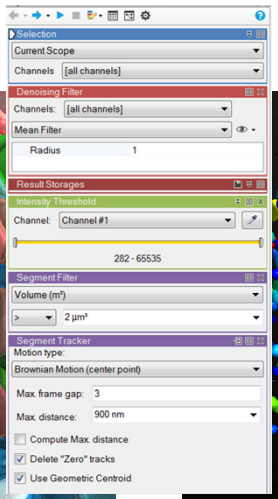
arivis **Vision4D** Analysis - Highlights

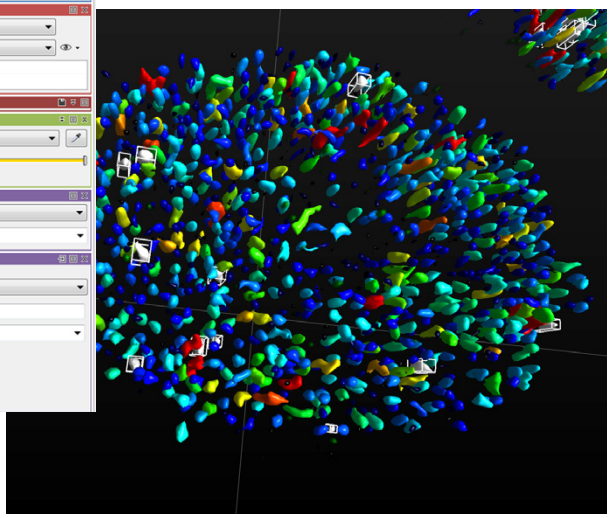
- Iterative and flexible Pipeline approach
- Advanced yet easy to use filtering and segmentation tools with preview options
- Integrated Machine Learning
- Membrane based cell detection
- Automatic and/or manual segmentation of objects
- Save and re-use pipelines with other data sets
- Distance measurements, compartmentalization and classification
- Interactive and flexible object display options (sorting, colouring, charts)
- User-specified custom measurements such as ratios or group statistics
- Automatic and custom grouping capabilities
- Full flexibility to combine different arivis operators and own solutions (incl. MATLAB)
- More efficiency and ease of use in analysis with optional upgrade to Virtual Reality

FLEXIBLE ANALYSIS PIPELINE



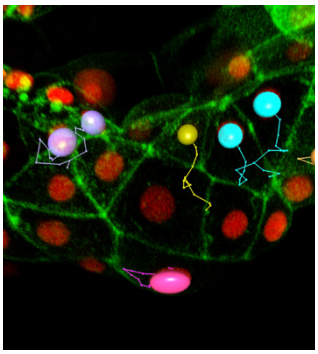






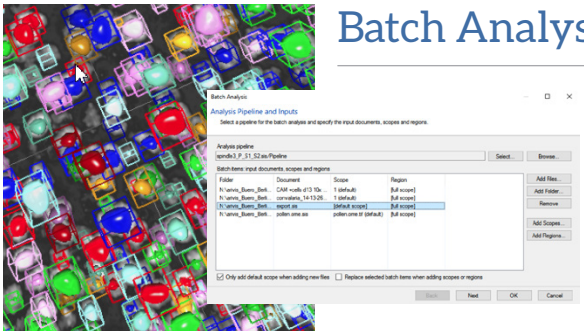
Left: These data were kindly provided by Tsung-Li Liu, Srigokul Upadhyayula, Tom Kirchhausen, and Eric Betzig and appear in their excellent paper: "Observing the cell in its native state: Imaging subcellular dynamics in multicellular organisms" **Right:** Hela cells stained with Hoechst, AuroraB-A488 (Kinetochore components), Tubulin-A568 (Spindle fibers), ACA-A647: Anti Centromer antibodies, Image courtesy of Carl ZEISS microscopy: ZEISS AxioObserver 7 with Colibri 7 illumination, deconvolved with ZEN Blue 2.5

MODULES



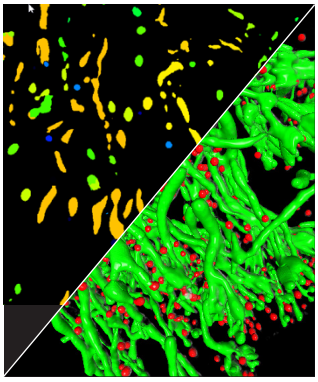
Tracking & Lineage Module

Tracking cells or subcellular particles in microscopic data can be challenging. The arivis **Vision4D** Tracking Module allows the tracking of objects throughout time series in both 2D or 3D image sets of any size. **Vision4D** offers an easy to use approach with full control and interactivity at all steps. Several automatic algorithms allow fast and reproducible tracking which can be readily applied to other data sets. When automatic algorithms meet their limitations, use Virtual Reality to proof read and correct your automatically created results much more efficiently than ever before.



Batch Analysis Module

The arivis **Vision4D** Batch Analysis Module can be used for the unattended execution of a pre-configured analysis pipelines on a series of images or regions of interest. Analysis Pipelines created in the arivis Analysis Module can be easily applied to multiple datasets. For routine workflows and inexperienced users, predefined Analysis Pipelines can be used and adapted easily.



Import/Export of Objects from Open Source

The arivis **Vision4D** Exchange Objects Module allows to easily interface with your specific workflows whenever you are using segmentation functions in open source, such as FiJI, ImageJ or Ilastik. Import these results with a single step and visualize or further analyze your 3D objects to measure e.g. volumes or count vesicles within cells or ROIs. Create high quality renderings for publications from segmentation results from other programs. The 2D/3D split views allow interactive exploration of the results in 3D with feature-based color coding or interactive gating in scatter plots or time line graphs.

Volume Fusion

The Volume Fusion is an excellent tool to fuse two image sets at any arbitray angle in 3D. You can rotate and translate one Image Set against another image set and merge them to create a fused volume for further processing, rendering or analysis. Settings for the rotation, translation and scaling of the volumes can easily be configured using landmark registration or by rotating a surface extracted from the moving volume directly in the 4D viewer. The ability to merge volumes into new channels or to blend them into the existing volume data adds a high level of flexibility for further processing workflows.

Image Courtesy: vDisco technology, Ertürk Lab,

Europe
+49 (381) 4613930
info@arivis.com

USA
+1 (800) 377-6962
info@arivis.com

Visit arivis.com/imaging to find out more