

## RELEASE NOTES - AMIRA 6.7.0 – AVIZO 9.7.0 - OCTOBER 2018

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### Amira 6.7.0 – Avizo 9.7.0

3D Data Visualization and Analysis Software

Dear Amira-Avizo User,

With this document, we would like to inform you about the most important new features, improvements, and changes in this version of Amira-Avizo. Please read these Release Notes carefully. We would appreciate your feedback regarding this version. If you encounter problems, but also if you have suggestions for improvement, please report them to [fei-sw-support@fei.com](mailto:fei-sw-support@fei.com). We would like to thank you in advance for your efforts.

October 2018, the Amira-Avizo team

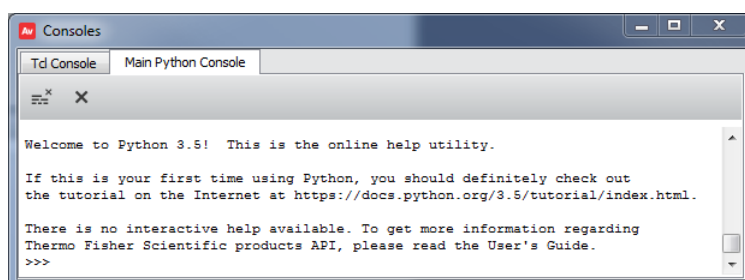
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## AVIZO LITE AND AMIRA - ENHANCEMENTS AND NEW FEATURES

### PYTHON 3.5

This release is based on Python 3.5.2 and removes Python 2.7 support. There are some compatibility breaks between Python 2 and Python 3. The Python official documentation concerning porting to Python 3 can be found here: <https://docs.python.org/3.5/howto/pyporting.html>.

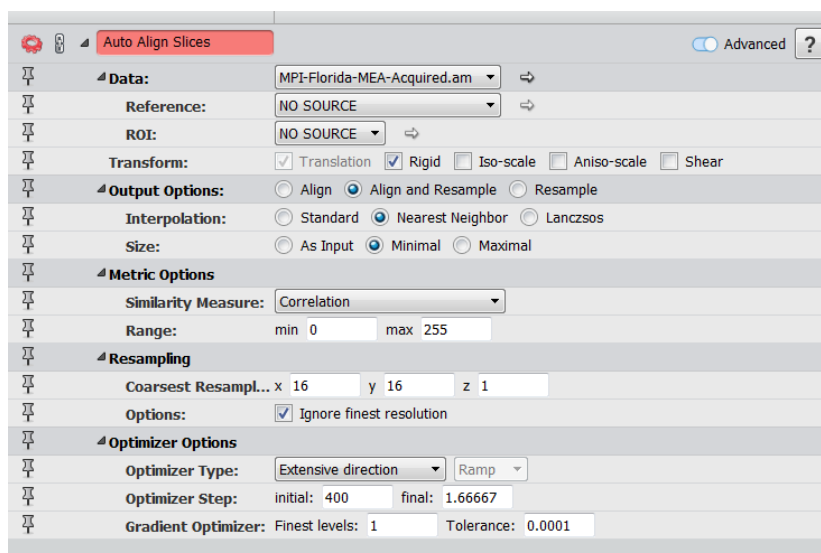


- Compatibility with Matplotlib and PyQt
- OpenCV available in default packages list
- New Deployment Manager (EDM) which allows quick creation of multiple self-contained Python environments

### NEW MODULES

#### AUTO ALIGN SLICES

This module allows aligning a stack of 2D slices automatically. The module supports affine transformations. This module internally uses the Register Images module for alignment and the Resample Transformed Image module for resampling.



### DECONVOLUTION

Prior to this release the Deconvolution module was not able to process data larger than 512MB. This limitation has been removed and the module is now only limited by the amount of available memory.

### FILAMENT EDITOR

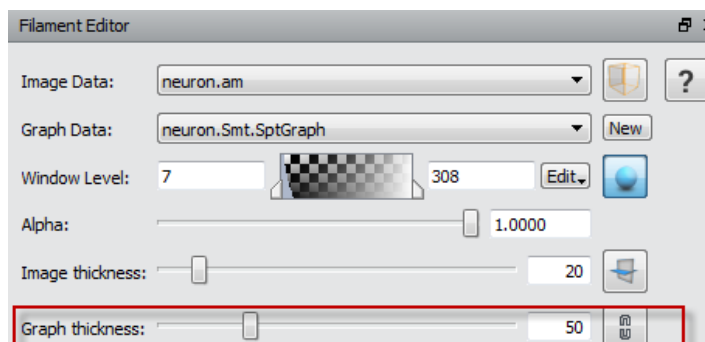
(XFiber license for Avizo)

A set of shortcuts has been added to the filament editor in order to control the size of the nodes, points and segments:

- Increase node size: CTRL + PAGE\_UP
- Decrease node size: CTRL + PAGE\_DOWN
- Increase segment size: SHIFT + PAGE\_UP
- Decrease segment size: SHIFT + PAGE\_DOWN
- Increase point size: ALT + PAGE\_UP
- Decrease point size: ALT + PAGE\_DOWN

Also undo (CTRL + X) and redo (CTRL + Y) capability has been added when assigning a selection to a label or creating a new label in a group.

In the 2D slice viewer, the visible part of the tracing can now be set independently from the slab thickness by clicking the new Link image and graph thickness button and adjusted by the new Graph thickness slider.

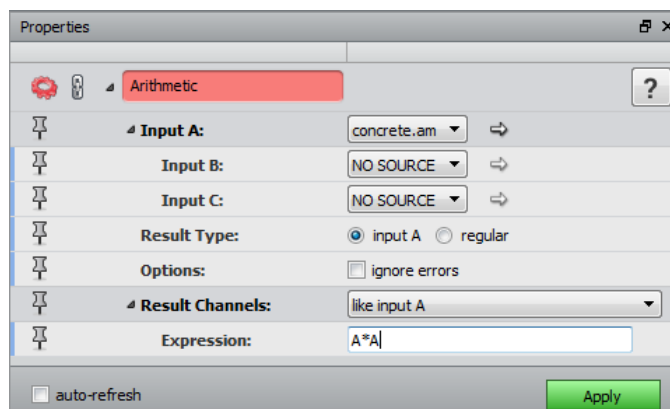


### VECTORS SLICE / VECTOR PLANE / VECTOR FIELD

A new port has been added to Vector Slice, Vector Plane and Vector Field visualization modules allowing control of the width of the lines showing vector direction.

## PROPERTIES AREA

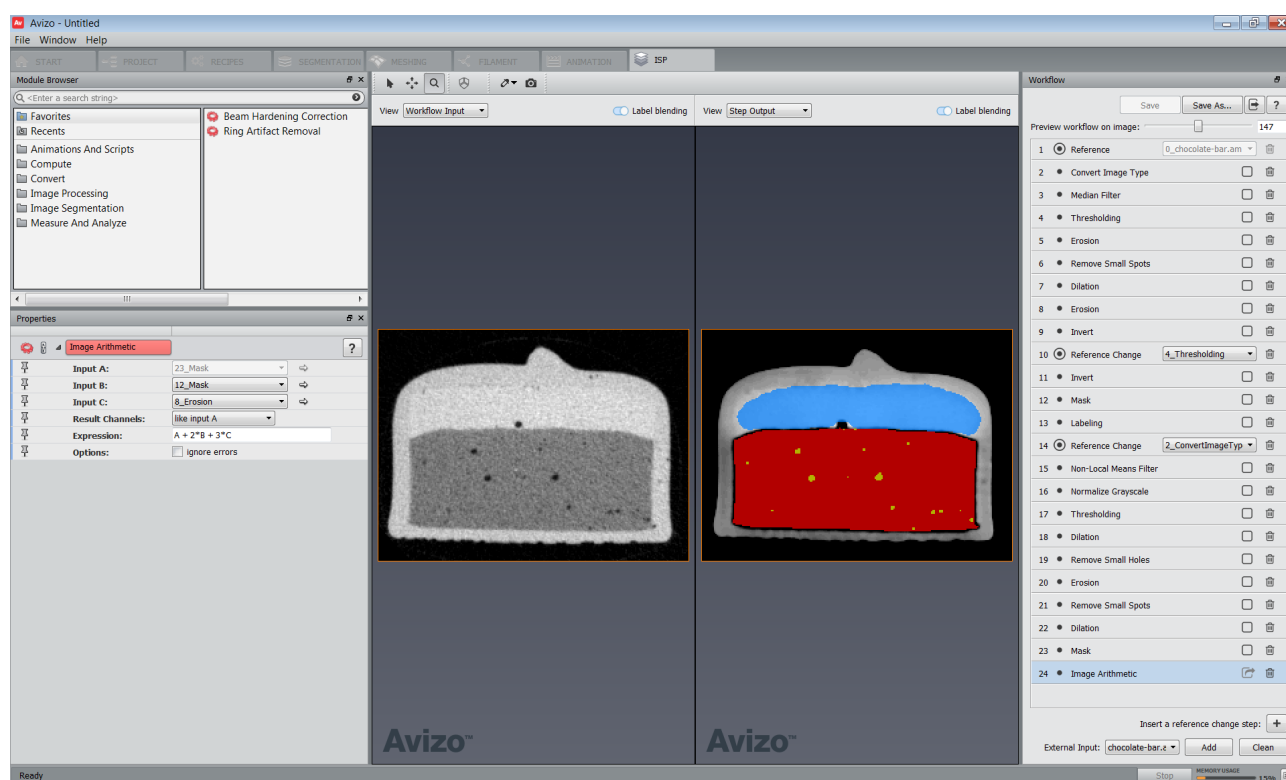
All data connection ports for a module in the properties window are now placed at the top of the panel.



## IMAGE STACK PROCESSING

The Image Stack Processing module is one of the major new features of this release and allows the creation and execution of image processing recipes (a recipe automates the execution of a series of modules to reapply it on any compatible data), to process an image stack in 2D (each image of the stack is processed individually)

The Image Stack Processing editing workroom features an interactive and dynamic editing environment, giving constant feedback about the recipe being built. Any step of the recipe can be accessed and modified, with immediate feedback about the impact of each change on the final output. It is an optimized 2D setup to enhance and segment data in Avizo software.

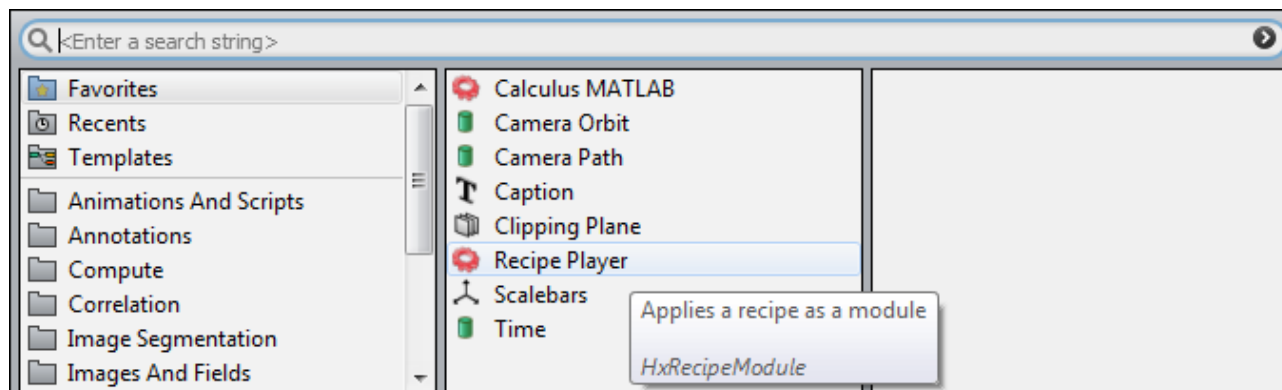


The Image Stack Processing extension can also be used in a batch mode from a command line. This mode is useful for online processing (live image processing during acquisition).

## RECIPES V2

The recipe mechanism is now available with Avizo and Amira XImagePAQ and has been enhanced with the following functionalities.

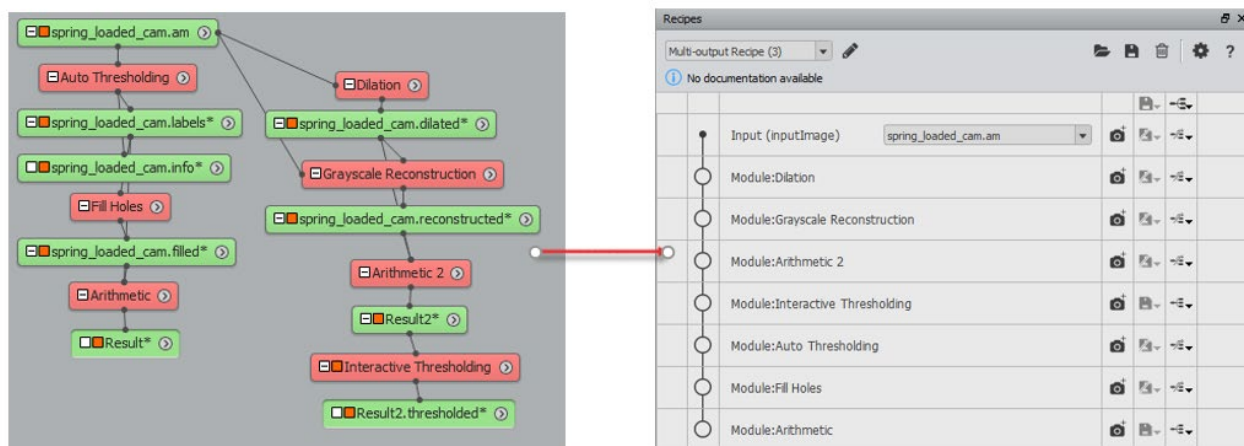
### RECIPE PLAYER MODULE



This Recipe Player modules allows for running a recipe from the project workspace. A recipe can be selected and input(s) defined. Results are automatically generated after the module is applied.

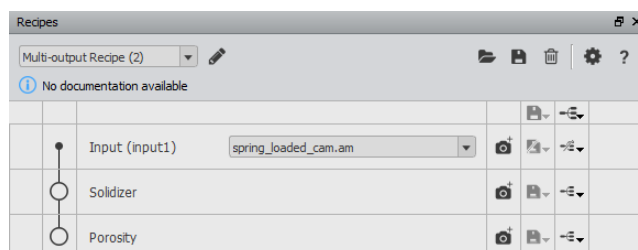
### RECIPE FROM MULTIPLE OUTPUTS

It is now possible to create a recipe that generates multiple outputs by selecting the list of outputs instead of a single one, and then creating the recipe.



### RECIPE INSIDE A RECIPE

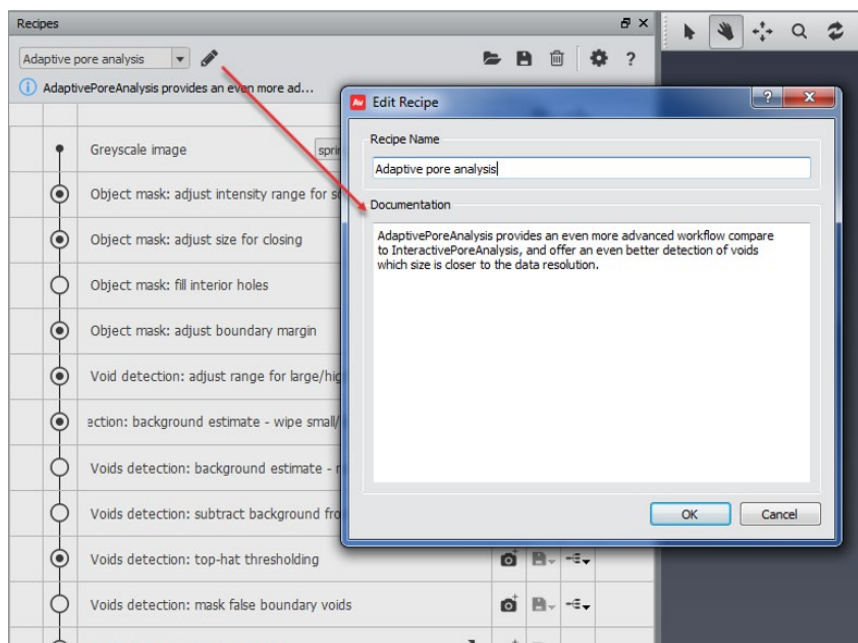
A recipe player module can be a step of another recipe, so a recipe can execute another recipe.



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## RECIPE DOCUMENTATION

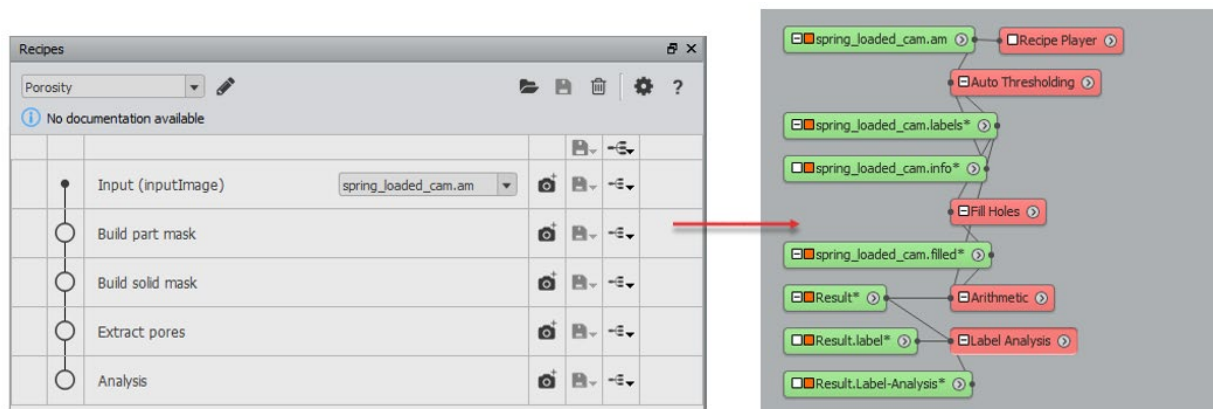
A recipe can be documented from the Recipe workbook.



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## CONVERT RECIPE TO GRAPH

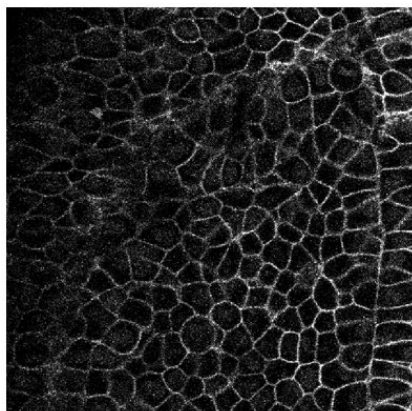
A new mechanism allows export of a recipe from the Recipe Player into a Project graph. This allows for editing the recipe, adding/deleting modules in the workflow and/or changing port values. The recipe can then be re-created once changes have been made to the graph.



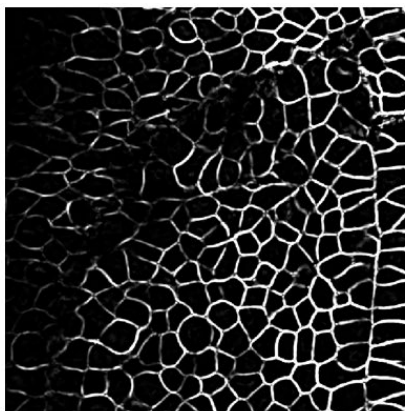


## MEMBRANE ENHANCEMENT FILTER

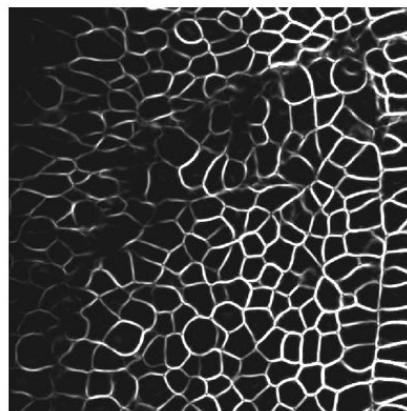
A Hessian matrix is used for detection of ridges (membranes), then Gradient Tensor is used for detection of edges (blobs or cylinders). Then filters enhance the different structures, and then a local tensor distribution is used for further enhancements such as smoothing membranes, closing holes and filling discontinuities.



Original



Feature Enhancement



Tensor Voting

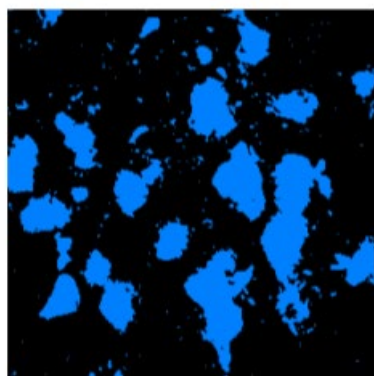
## SELECTIVE MORPHOLOGICAL OPERATORS

**Selective Opening:** This algorithm performs a selective erosion followed by a selective dilation. This operator is smoother than the classic opening and softens the appearance of the structuring element in the filtered image.

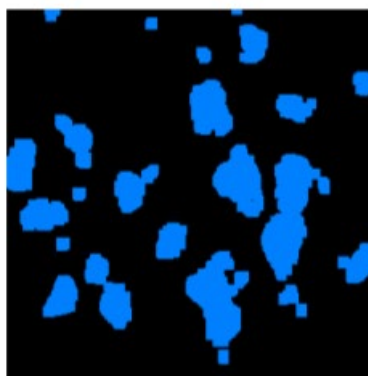
**Selective Closing:** This algorithm performs a selective dilation followed by a selective erosion. This operator is smoother than the classic closing and softens the appearance of the structuring element in the filtered image.

**Selective Erosion:** This algorithm erodes objects conditionally to a local constraint. This operator is smoother than a standard erosion and softens the appearance of the structuring element in the filtered image.

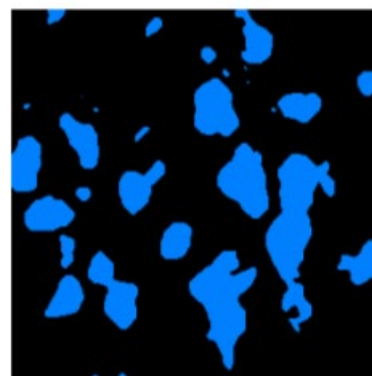
**Selective Dilation:** This algorithm dilates objects conditionally to a local constraint. This operator is smoother than a standard dilation and softens the appearance of the structuring element in the filtered image.



Binary 2D input image



Classic opening, 3 iterations

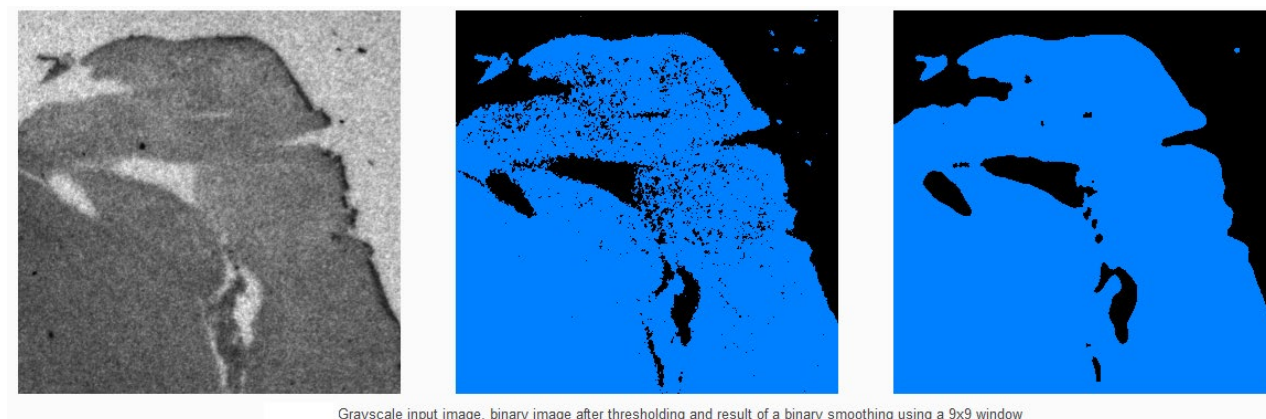


Selective opening, 3 iterations, N=4

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## BINARY SMOOTHING

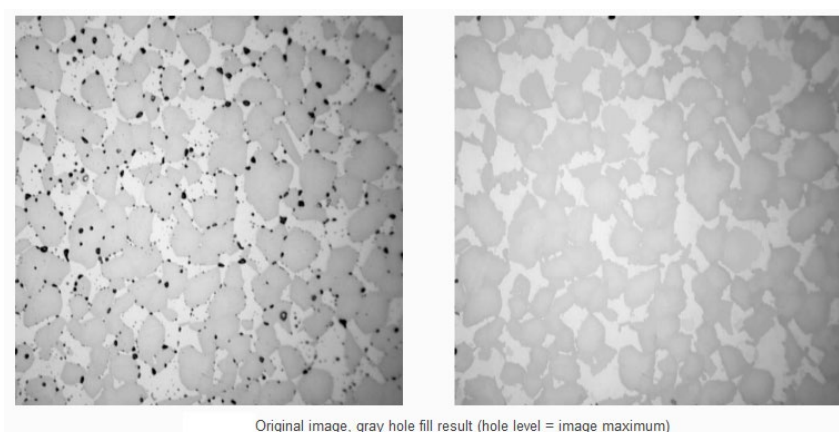
This module transforms a binary image into another binary image depending on the real local mean of its neighborhood.



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## GRAYSCALE FILL HOLES

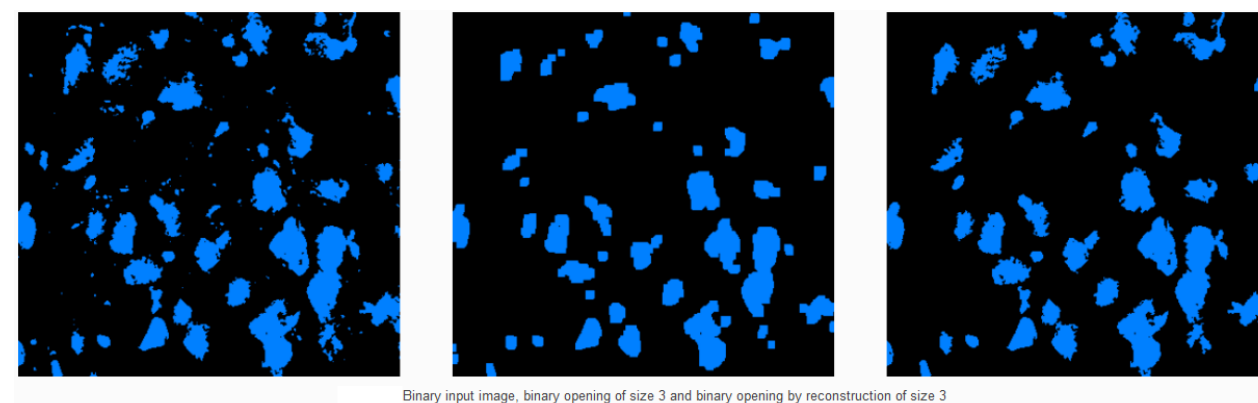
This module fills darks areas that are not connected to the image borders with the maximal gray level surrounding them.



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## OPENING/CLOSING BY RECONSTRUCTION

An opening/closing by reconstruction consists of applying an erosion/dilation followed by a morphological reconstruction. Different structuring element geometry can be selected.

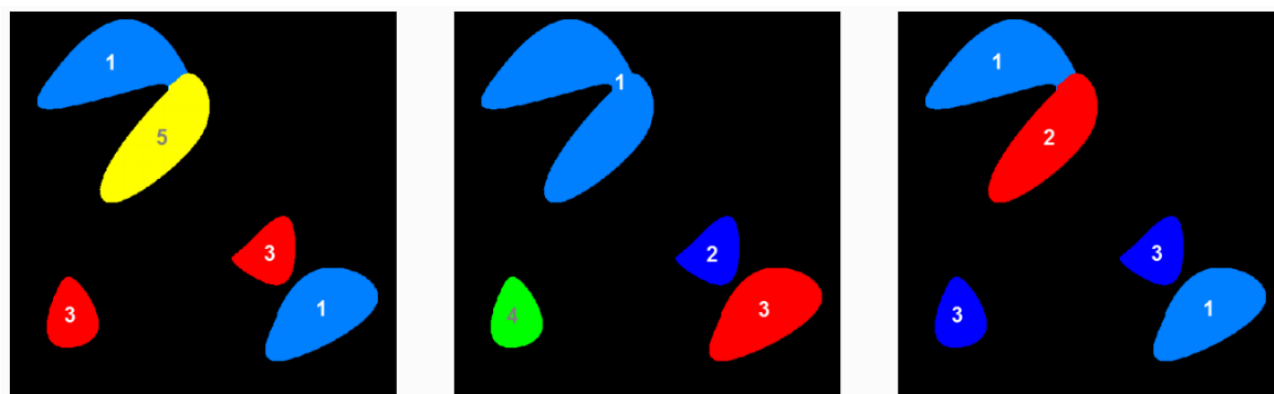


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## REORDER LABELS

When a label image has some missing values in its histogram, it is not possible to reassign automatically some consecutive labels by using the Labelling module which assigns a unique value to each connected component.

The Reorder Labels module fills the missing values of the histogram while preserving the original connectivity of the input labels.



Input label image, output of the **Labeling** module and output of the **Reorder Labels** module

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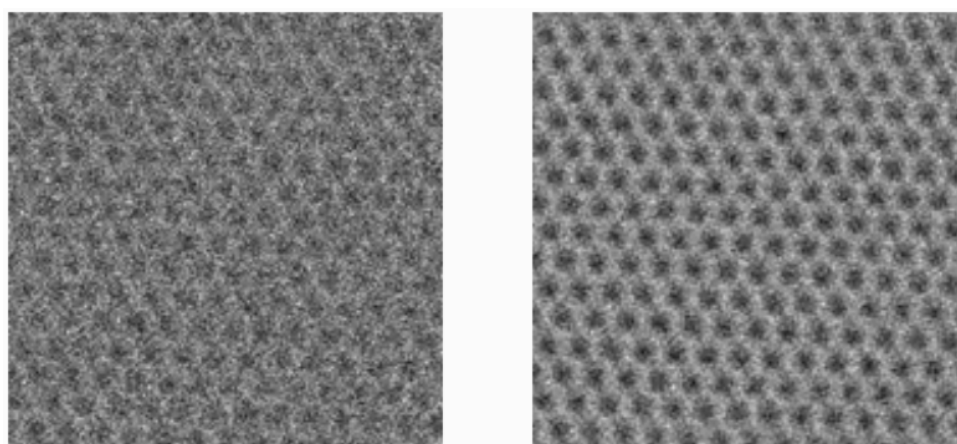
## PRUNING

This module removes from a 3D binary image all object voxels having only one neighbor. It can be applied either by specifying a number of iterations or until convergence. This feature can be used for removing terminal branches from a skeleton.

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## RADIAL FREQUENCY FILTER

This module applies a radial background correction in the Fourier domain, then eliminates the high frequencies by applying a circular mask and reverts to the spatial domain. This filter is especially useful for highlighting periodic structures such as crystalline material in high-resolution electron microscope images.

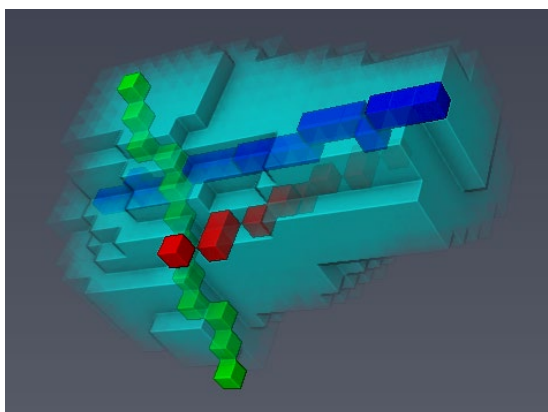


Input image and result of radial frequency filter

## FERET MEASURES

The **Length3d**, **Width3d**, **Breadth3d** and **Thickness3d** measurements return specific axis lengths based on the Ferret diameters. In previous versions it was impossible to control visually the location of these axes. For each axis, 6 new measurements have been added in the Ferret category. These measurements return the coordinates of the extremities of each axis. For instance:

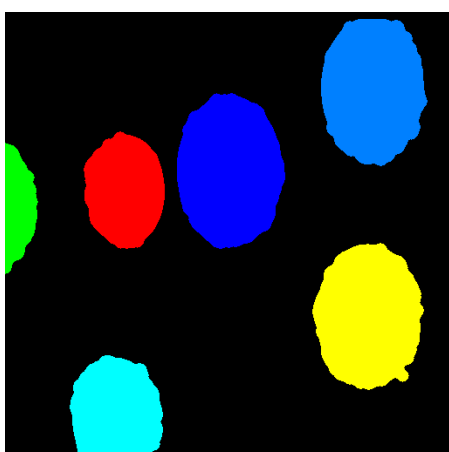
- **Length3dInputX**, **Length3dInputY**, **Length3dInputZ** are the coordinates of the first end of the Length3d axis.
- **Length3dOutputX**, **Length3dOutputY**, **Length3dOutputZ** are the coordinates of the other end of the Length3d axis.



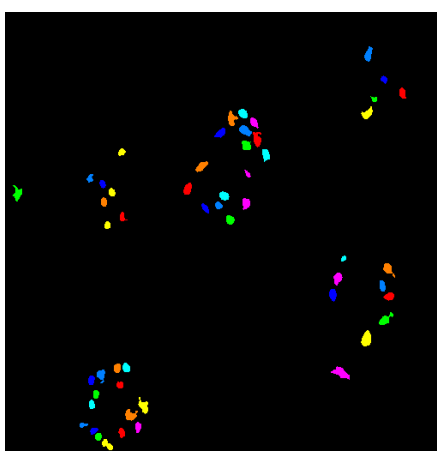
Representation of Length3d (blue), Breadth3d (green) and Thickness3d (red)

## INTENSITY COUNT

The new measurement **IntensityCount** returns the number of different gray levels in the intensity image associated with each object of the label image. It is particularly useful for counting the number of markers in an image under a mask defined in another image.



Input label image



Input intensity image

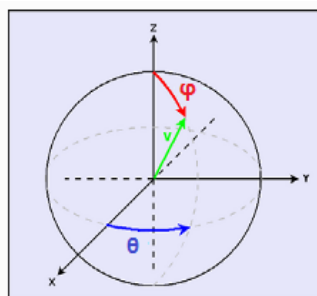
	IntensityCount
1	5
2	16
3	7
4	1
5	9
6	15

IntensityCount result

## THICKNESS ORIENTATION PHI – THICKNESS ORIENTATION THETA

Angle Phi/Theta of the Thickness 3D diameter over a range of angles [0,+90].

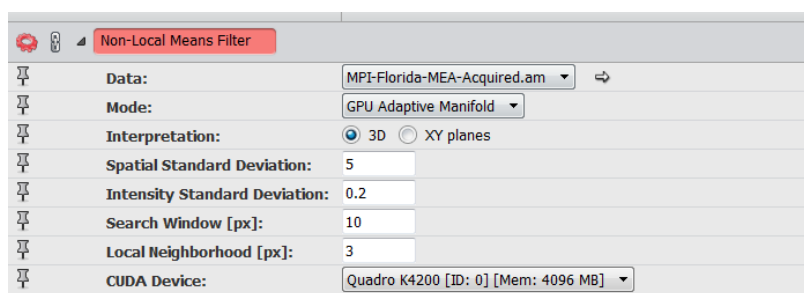




## ENHANCED FEATURES

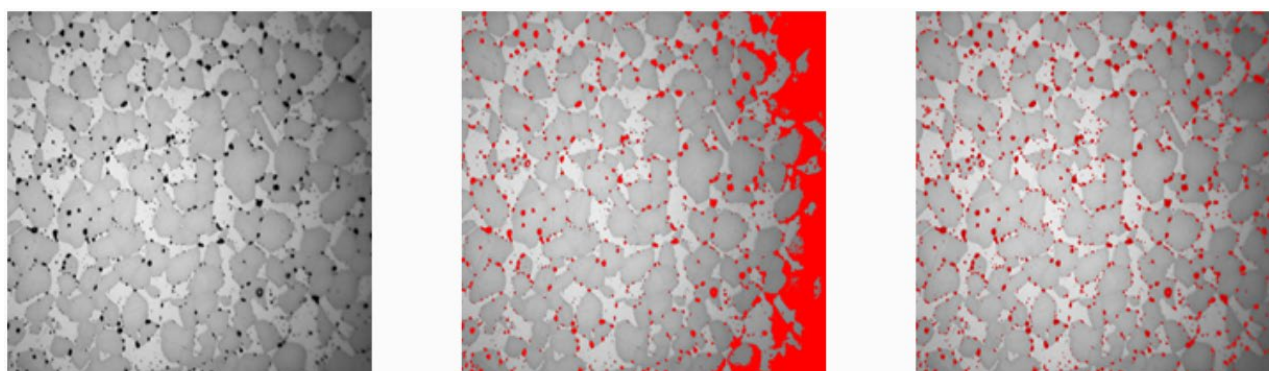
### NON-LOCAL MEANS FILTER

The NLM filter module has been enriched with a new GPU Adaptive Manifold mode with a huge performance improvement, especially in 3D mode. A new CPU mode replaces the previous one. The prior GPU mode is still available.



### ADAPTIVE THRESHOLDING

The Adaptive Thresholding module has been enhanced. This module performs a binarization by applying a threshold that is automatically adapted relative to the mean intensity of a sliding window. The former Adaptive Thresholding module has been renamed to **Feature Adaptive Thresholding**.



Grayscale input image, tentative of binarization with a global threshold, result of a local adaptive thresholding, retaining pixels lower than 90 percent of the local mean

### GAUSSIAN FILTER

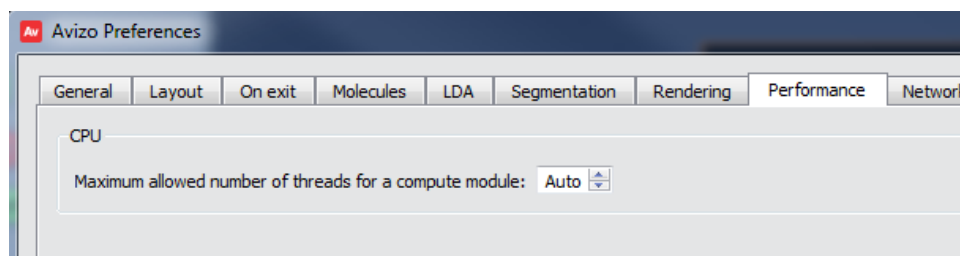
The Gaussian filter modules has been reimplemented by replacing legacy algorithms with a separable Finite Impulse Response (FIR) filter and an Infinite Impulse Response (IIR) filter mode. Depending on kernel size, both new modes offer greatly improved performance.

## VARIANCE

This module computes the local variance of gray values within a box neighborhood.

## SET NUMBER OF THREADS USED BY VISILOG

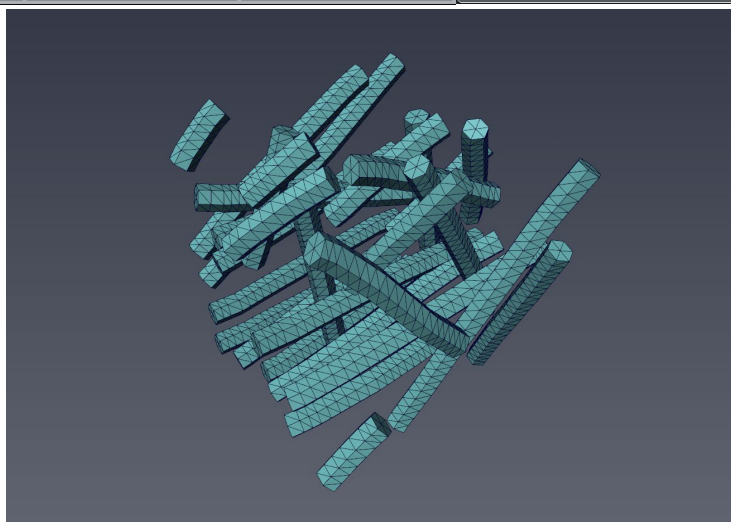
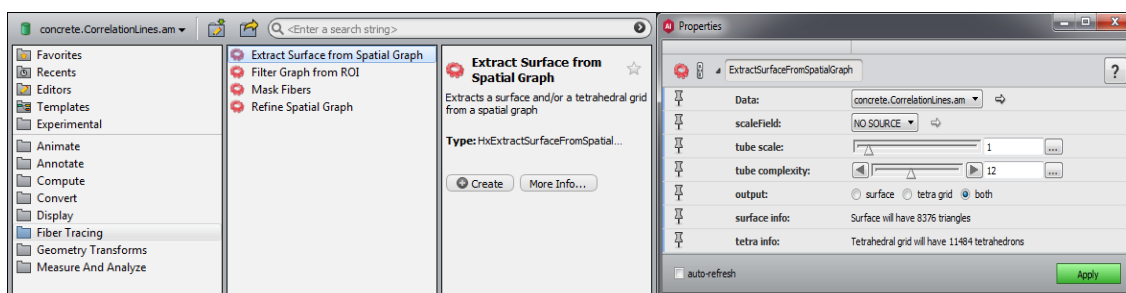
The underlying image processing library (Visilog) implements various multi-threaded algorithms. The number of threads can now be controlled by setting the preference in the Performance tab of the Preferences dialog. With previous versions, this preference was only used by certain modules that were outside of the image processing library.



## AMIRA XTRACING AND AVIZO XFIBER EXTENSION - ENHANCEMENTS AND NEW FEATURES

### EXTRACT SURFACE FROM SPATIAL GRAPH

This new module allows extraction of a surface and/or a tetrahedral grid object from a Spatial Graph object. This surface or grid can be used for further fiber property simulation.



## AVIZO AND AMIRA XDIGITALVOLUMECORRELATION EXTENSION - ENHANCEMENTS AND NEW FEATURES

The Digital Volume Correlation module now outputs the displacement increment for each iteration in the console.

## XPAND EXTENSION - ENHANCEMENTS AND NEW FEATURES

Avizo and Amira on macOS are now using the Clang compiler. XCode 7 and higher are supported.

## EXPERIMENTAL EXTENSION - ENHANCEMENTS AND NEW FEATURES

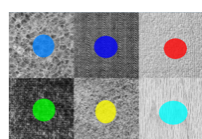
Experimental modules are made available upon request and are not part of the supported modules. They are provided as possible technology to be integrated in future versions of the application without any warranty of permanence. Most of the time these modules did not reach productization standards and are available for testing purposes only.

### NEW MODULES

#### TEXTURE SUPERVISED CLASSIFICATION

From a grayscale image, a label image and a set of measures, this new experimental module computes a classification object and then does supervised classification at the pixel level:

- Feature extraction
- Training
- Segmentation



training texture image

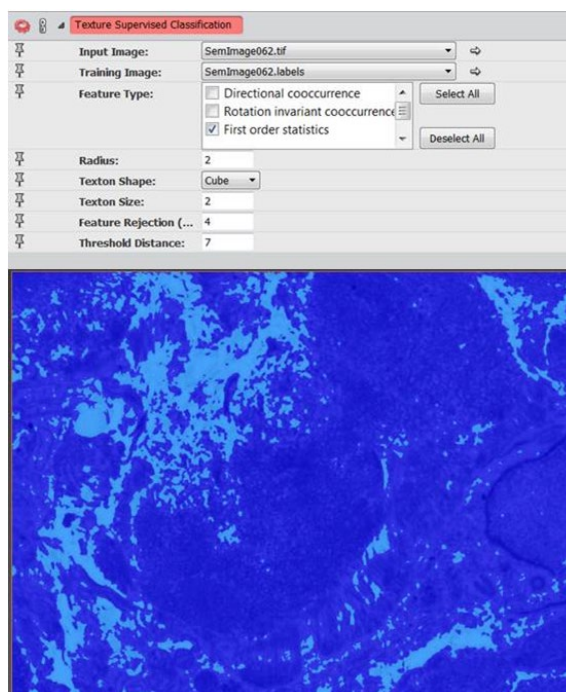


Labels : training regions  
(user defined)



Object containing :

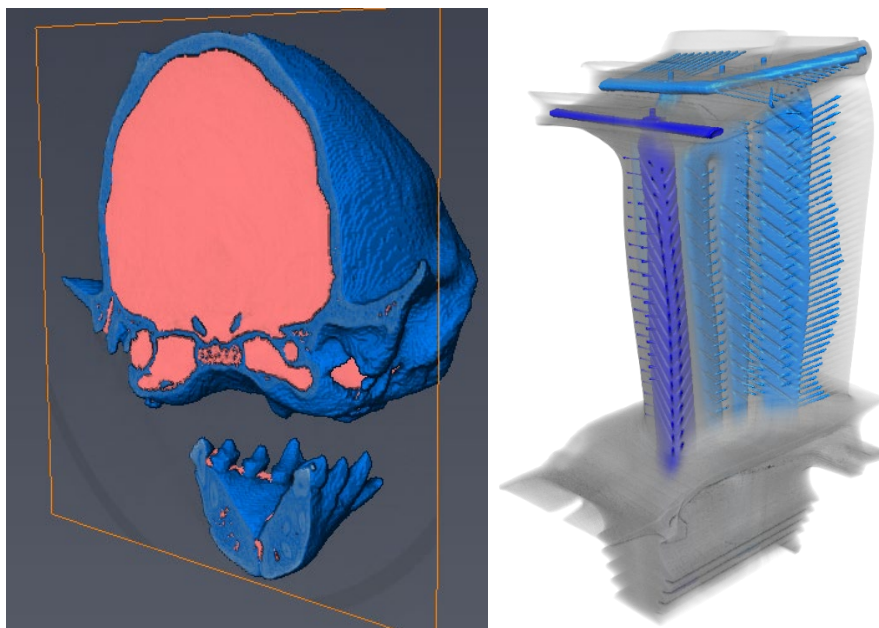
- selected measures
- centers of classes





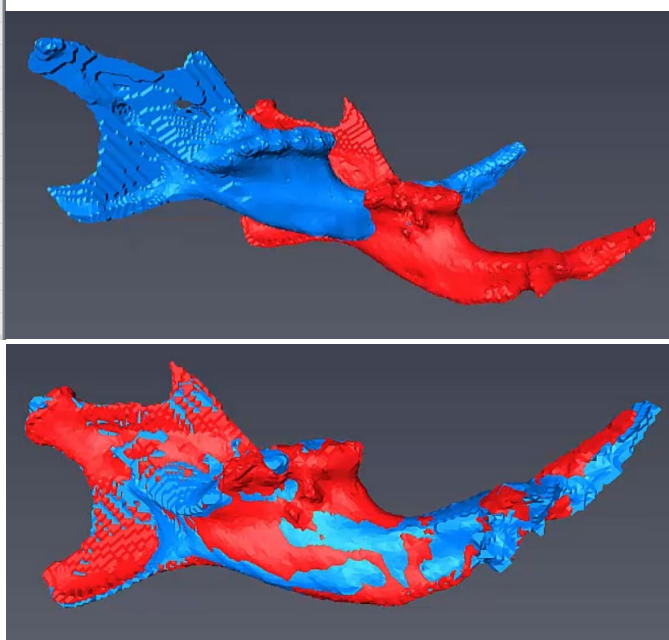
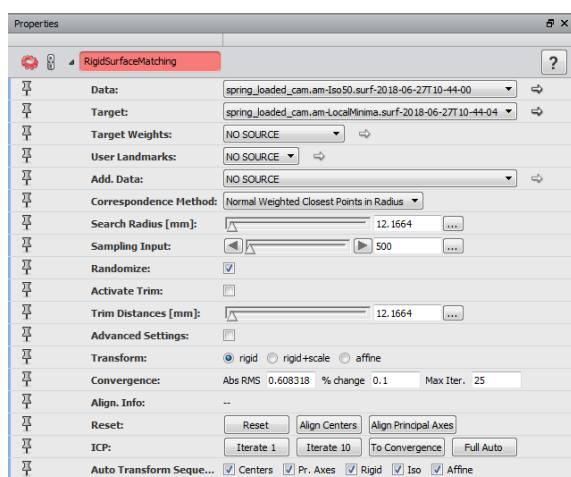
## AMBIENT OCCLUSION

This new experimental module allows filling of cavities in a sample and thus helps in the detection or segmentation of these cavities. Cavity detection is based on an occlusion map.



## SURFACE MATCHING

The new Surface Matching modules allows for very fast surface registration, both rigid and non-rigid.

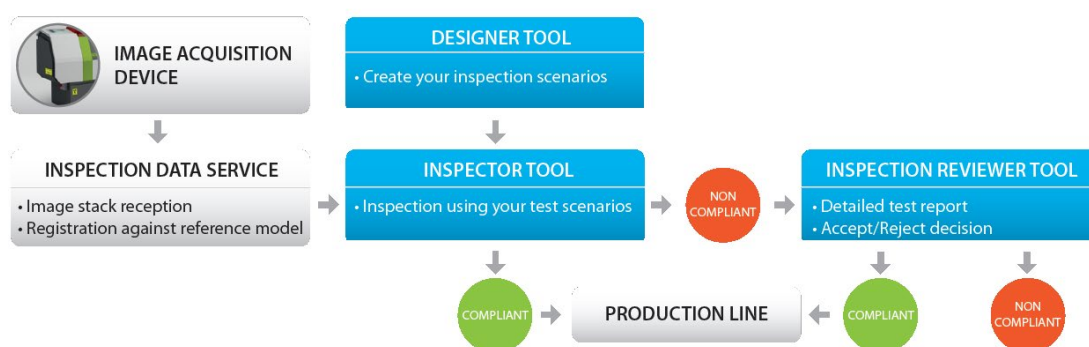


## AVIZO FOR INDUSTRIAL INSPECTION - ENHANCEMENTS AND NEW FEATURES

### NEW AVIZO INLINE EXTENSION

The Avizo Inline framework enables the automation of specific tasks. It has the capability to work in high-volume inspection processes. The Avizo Inline system can be separated into four major applications:

1. The “Receiver Service” is in charge of receiving pushed images from the scanner and registering them using a reference model.
2. The “Designer” application is in charge of defining the inspection scenario.
3. The “Inspector” application is in charge of reviewing the pushed models which are received by the “Receiver Service”. It uses scenarios defined by “Designer” to inspect the scanned model and accept or reject the part depending on analysis results.
4. The “Reviewer” application is used to review the inspected model and understand why a model has been rejected during the Inspection process.



### PTB CERTIFICATION

The numerical accuracy of algorithms for computing “Chebyshev associated features” has been tested. All deviations of the algorithms under test were below the maximum permissible errors for all quality characteristics.

Im Auftrag

On behalf of PTB

Dr.-Ing. Prof. h. c. Frank Härtig

Direktor und Professor

Braunschweig, 2017-05-31

Siegel  
Seal



Im Auftrag

On behalf of PTB

Dipl.-Ing. Matthias Franke

## NEW CAD READERS

File extensions	File Format
.catpart, .catproduct	CATIA V5
.3dxml	CATIA V6
.iges, .igs	IGES
.jt	JT
.xmt, .x_t, .x_b	Parasolid
.par, .am, .psm, .pwd	Solid Edge
.sldprt, .sldasm	SolidWorks
.prt	Unigraphics
.step, .stp, .stp.Z	STEP
.dwg	AutoCAD DWG
.asm, .prt, .xar, .xpr	PROECREO
.vda	VDA

### CATIA V5 Input details:

- Supports release from CATIA V5 R7 to R23 (called V5-6R2013)

### CATIA V6 Input details:

- Supports Geometry Reading from R2010x to R2013x

### DWG Input details:

- Supports version from 2.5 up to 2013
- Converts 3D entities and meshes
- Converts wireframe

### IGES Input details:

- Supports release until 5.3

#### JT Input details:

- Supports Tessellated Jt 3D files, and B-REP
- Supports formats up to 10.2

#### PARASOLID Input details:

- Supports version v7 to v26

#### ProE/Creo Parametric Input details:

- Supports Pro/E 2000i to Creo Parametric 2.0

#### Solid Edge Input details:

- Supports version up to ST6

#### SolidWorks Input details:

- Supports version 1999 to 2014

#### STEP Input details:

- Supports STEP protocols: AP203 (Edition 1, Edition 2), AP214 (up to Edition 3), AP242 (Edition 1 pre-DIS)

#### Unigraphics Input details:

- Supports version v10 to UGNX9

## FUTURE DEPRECATIONS

This section documents the features that will be deprecated or removed from next Amira-Avizo version.

.Zhi files will only be read with the Bio-Formats extension, the native ZVI reader being deprecated.

The XGreen extension will be removed from the product.

gcc 4.4.x and Red Hat Enterprise Linux 6 will no longer be supported. The next version will support gcc 4.8.x and Red Hat Enterprise Linux 7 only.

## COMPATIBILITY NOTES

### AUTO SKELETON / THINNER MODULE

In previous Amira-Avizo versions, Auto Skeleton and Thinner modules could take non-binary label data as input, but would generate erroneous results for this type of data. Starting with Amira 6.7 – Avizo 9.7, Auto Skeleton and Thinner modules cannot be connected to non-binary label inputs, the algorithms of those modules being valid for binary labels only.

If you have saved projects from previous versions with non-binary label data input for those modules, they will reload with errors in Amira 6.7 – Avizo 9.7. You will need to convert the input data to binary in order to fix them; to perform the conversion you can use, for example, the Arithmetic module, setting the expression to  $A > 0$ .

### FILTER SANDBOX / DUALBEAM 3D WIZARD MODULE

In this new version and with the evolution of the **Non-Local Means filter**, the Filter Sandbox now uses the new GPU Adaptive manifold mode with significant performance improvements, especially in 3D mode, but which is potentially slower in 2D.

The DualBeam 3D wizard module uses now the new CPU mode of the Non-Local Means filter.

If you have saved projects from previous versions with Filter Sandbox module with Non-Local Means Filter, or Dual Beam 3D wizard, they will reload with errors in Amira 6.7 – Avizo 9.7 that you can ignore. In order to obtain similar performance to the saved project, it is recommended to set the Interpretation to 3D mode which is faster in this version.

## ANTIALIASING ON MAC OS

In this version, on macOS, Antialiasing is not supported when using the following features:

- Volren
- Measures
- Surface Editor

## OPERATING SYSTEMS

Amira 6.7 – Avizo 9.7 runs on:

- Microsoft Windows 7/8/10 (64-bit).
- Linux x86 64 (64-bit). Supported 64-bit architecture is Intel64/AMD64 architecture. Supported Linux distribution is Red Hat Enterprise Linux 6 and Red Hat Enterprise Linux 7.
- macOS Sierra (10.12) and macOS High Sierra (10.13).

Avizo 9.7 for Industrial Inspection and Inline Extension run on:

- Microsoft Windows 7/8/10 (64-bit).

In order to add custom extensions with Amira-Avizo XPand, you will need:

- Microsoft Visual Studio 2013 (VC12) Update 4 on Windows.
- gcc 4.4.x on Red Hat Enterprise Linux 6 and Red Hat Enterprise Linux 7.
- XCode7 or greater on macOS

## SOLVED ISSUES

Amira 6.7 – Avizo 9.7 provides many enhancements and solutions to known problems, including the following:

<b>Avizo ToGo</b>	65801	Avizo ToGo can now read project files with large data sets (data size > 2GB).
<b>Camera Path</b>	25659	Camera Path now takes zoom into account when using orthographic camera.
<b>Colormap</b>	22456	When switching a visualization module between gray scale data and label data, the colormap is now correctly updated.
	58404	Colormap labelcolors.am now loads correctly when the data directory path (AMIRA_DATADIR or AVIZO_DATADIR) is set to a custom value.
<b>Connected Components</b>	69645	Connected Components module now takes into account input data transformation.
<b>Data Parameter Editor</b>	66971	When running a Parameter Search, Search Next function has been fixed.

DICOM	34605	The documentation has been improved to describe the "-defaults" option
	67685	DICOM data export has been fixed so that all the DICOM tags are correctly exported.
	35036	DICOM reader now supports JPEG Baseline (JPEG 8-bit) files.
	38589	DICOM reader now supports JPEG 20000 files.
Digital Volume Correlation	70383	Voxel size is now taken into account when an initial displacement is used in Digital Volume Correlation global approach.
Export Data As	68506	When multiple extensions are available for a given file format, it's now possible to export a file in any of these formats. (For example, for JPEG file format, following extensions can be used: .jpeg, .jpg, .JPEG, .JPG)
Extract Spreadsheet	65368	When used to export tracking results, the Event type column would contain all 0. This has been fixed.
Extract Subvolume	42971	The dragging of the box over the data boundingbox on one side could lead to box modification on the other side. This has been fixed.
	68526	The memory usage for Extract Subvolume module would sometimes display erroneous values. This has been fixed.
	68527	The option "Do not show this message again" now works properly for the memory usage warning message.
Filament Editor	40724	When working on a single slice data, only linear tracing method was available. All tracing methods are now available.
Filter Sandbox	58576	Binary preview is now correctly managed when filtering a data set with negative values.
Help	67599	When printing a help topic from the print button in help browser, the output is not truncated anymore.
Histogram	72183	Tindex would compute erroneous values on large data sets. This has been fixed.
Image Read Parameters	68507	Renaming of imported files in Image Read Parameters dialog is now functional.
Installer	54095	Linux installer free disk space check would return erroneous information on certain configurations. This has been fixed.
Isosurface	69430	With shadowing enabled, Isosurface and Volume Rendering visualizations would interact incorrectly. This has been fixed.
Label Analysis	65286	Label Seek tool is now available for binary labels in the analysis table view.
	58081	The Rugosity measure could not be computed when the number of boundary pixels of an object was too high. This has been fixed.
Labeling	57332	For some data, the labeling command could assign two different labels to a same connected component. This has been fixed and the Labeling module results are now consistent when applied to a transformed input.
Local Thresholding	62737	Local Thresholding now supports data larger than 512MB.
Marker-Based Watershed / H-Extrema Watershed	58258	Those modules now support 32-bit integer and float data set input.
MATLAB	69380	On some Windows systems, MATLAB would fail to start. The loading of the dynamic libraries has been fixed.

<b>Metrology (Avizo for Industrial Inspection only)</b>	69501	Surface determination would fail on float data for ISO50, Otsu, Adaptive Sub-Voxel and Adjusted Sub-Voxel methods. A warning has been added to prevent the user from selecting one of those surface determination methods on float data.
	69618	
	69459	
<b>MRC reader</b>	63275	MRC reader can now load large MRC files. The size limit was 1024 images. It has been extended to 8192 images.
	61183	
<b>Multi-Channel-Field</b>	69220	Multi-channel fields containing LDA data can now be displayed using Slice or Ortho Slice modules. The colormap range of the display module is adjusted to the channel range ports.
<b>Multiply By Value / Divide By Value / Add Value / Subtract Value</b>	59927	When attached to a label field, those modules would create a new output data object each time the Apply button was pressed. The output is now re-used at each Apply.
<b>Nastran file format</b>	58423	Boundary Conditions and Materials names are now managed in exported NASTRAN files.
<b>Nifti</b>	71332	Nifti writer can now export compressed files.
<b>Object Popup</b>	39906	Text strings are no longer truncated in the Object Popup dialog with a specific Asian font.
<b>Open file</b>	63045	"Open Data..." and "Open Project..." dialogboxes now open on the last used directory.
<b>Ortho Views</b>	31929	The measures display in the Ortho Views module has been fixed
<b>Point Cloud</b>	68079	Saving and loading of a point cloud with labels in Amira mesh file format would fail. This has been fixed.
	40601	setDataValue Tcl command would fail when setting values in a byte data column of a point cloud. This has been fixed.
	68040	Trying to add a label column data to a point cloud would fail. This has been fixed.
<b>Pore Network Model View</b>	59865	The pore / throat scaling has been fixed to display correctly pores / throats with high pore / throat scale values.
<b>PortRangeSlider</b>	41362	It was not possible to edit PortRangeSlider range values when the mouse cursor was on the slider. This has been fixed.
<b>Preferences</b>	63705	Deprecated rendering preference "use high precision frame buffer" has been removed
<b>Preferences (Avizo for Industrial Inspection only)</b>	69392	The application would fail to start if RANSAC preferences were stored in micrometers. This has been fixed.
<b>Quick Probe</b>	69302	Stability has been improved when using Interaction mode and QuickProbe in ContinuousUpdate mode.
<b>Register Images</b>	62938	Registration with Iso Scale transform was not working properly in some cases. This has been fixed.
<b>Remove Small Holes</b>	66371	The module performance has been improved.
<b>ROI Box for Volume Rendering</b>	45104	Deletion of "ROI Box for Volume Rendering" module no longer impacts associated "Volume Rendering" module.



<b>Save</b>	61802	When saving 8-bit signed uniform scalar field data to Amira Mesh format, the .am file could not be re-loaded. This has been fixed.
<b>Segmentation Editor</b>	60081	The selection indicator (no selection/selection/hidden selection) is now updated correctly when pasting a selection.
	41212	When interpolating between two identical selections, some pixels could be skipped; this has been fixed.
	71472	Fill holes could produce some completely filled slices on specific data sets. This has been fixed.
	67843	8-bit signed data are now managed in the Segmentation editor.
<b>Separate Objects</b>	56271	When using Separate Objects module in connected objects mode, the label output was always 16 bits. It is now automatically upgraded to 32 bits when the number of labels exceeds 65535.
<b>Slice</b>	70170	When setting a plane via normal and distance plane definition method, the Slice display is now correct.
	67916	Slice position is now correctly restored from a saved project.
	67917	When setting a plane via normal and distance plane definition method, switching to another plane mode definition and back would reset the distance to 0. This has been fixed.
<b>Snapshot</b>	68081	Measurement boxes are now correctly rendered when taking snapshots in tiled or off-screen mode.
	64204	Size for viewer snapshot -offscreen Tcl command is now taken into account at each apply.
<b>Spatial Graph View</b>	59865	The node / tube scaling has been fixed to display correctly nodes / tubes with high node / tube scale values.
<b>Spreadsheet To Point Cloud</b>	67602	Spreadsheet To Point Cloud module would generate an erroneous point cloud. This has been fixed.
<b>Surface View</b>	60009	Surface View rendering has been fixed for Shaded Draw Style with Opaque option.
<b>Tcl</b>	69388	Tcl command to delete ports can now be used to delete multiple ports.
	72097	Performance issues can occur in Tcl scripts that create/apply modules many times. This may be due to the History Logging, used to create Recipes from module results. To improve performance in such scripts, the History Logging can be deactivated using the startLogInhibitor or activated using the stopLogInhibitor command. For more information, refer to "Avizo Script Interface" documentation.
<b>Thinner / Auto Skeleton</b>	71611	Non-binary label data input is no longer allowed with this module. See compatibility notes.
<b>Volren</b>	71372	Volren transfer functions would not reload properly if the Volren module had a space in its name. This has been fixed.
<b>Volume Rendering</b>	55627	On Mac machines with AMD graphic boards, Volume Rendering display has been fixed.



Our team is continually focused on solving as many issues as possible to make your experience of Amira-Avizo as satisfactory as possible. To this purpose, we would appreciate your feedback regarding this version. If you encounter problems, or if you have suggestions for improvement, please report them to [fei-sw-support@fei.com](mailto:fei-sw-support@fei.com).