

Release notes for Amira–Avizo 3D Software Version 2021.2

3D data visualization and analysis

This document informs you about the most important new features, improvements and changes in this version of Thermo Scientific™ Amira-Avizo™ software.

Please read these Release Notes carefully.

We would appreciate your feedback regarding this version. If you encounter any problems or have any suggestions for improvement, do not hesitate to contact us at FRBOR.3d_hotline@thermofisher.com.

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Introduction of new Segmentation+ workroom

For more than 15 years, the Segmentation Editor workroom of Amira-Avizo has allowed to address the most challenging segmentation tasks with efficiency thanks to a rich set of interactive tools. However, in front of the ever-increasing size of the images, the core technology behind this editor was presenting limitations.

In this release, we introduce a first version of a new workroom called Segmentation+, that will ultimately replace the Classic Segmentation Editor. Until then, both versions are accessible and you can switch between both at any time.

While the Segmentation+ workroom currently contains only a brush tool for segmentation, it proposes the following major enhancements:

- Much larger Input Images are now supported with a fluid display and navigation. Note that both the Segmentation+ and the Classic workrooms are limited to in-memory, grayscale input images. For instance, working with volumes presenting slices of 16000x16000 pixels, significant delays were experienced when zooming or changing the slice number whereas such actions happen seamlessly in Segmentation+. Likewise, the computation time using the brush on such data, assigning a selection to a material or creating a selection from a material is typically reduced by a factor 3 to 5.
- The Label Field can contain arbitrary number of materials, compared to the maximum 256 materials available in the Classic Segmentation workroom.
- Materials can be grouped. Note that this grouping is only effective in the Segmentation+ Workroom

The workroom will be enriched over future versions with more segmentation tools and features.

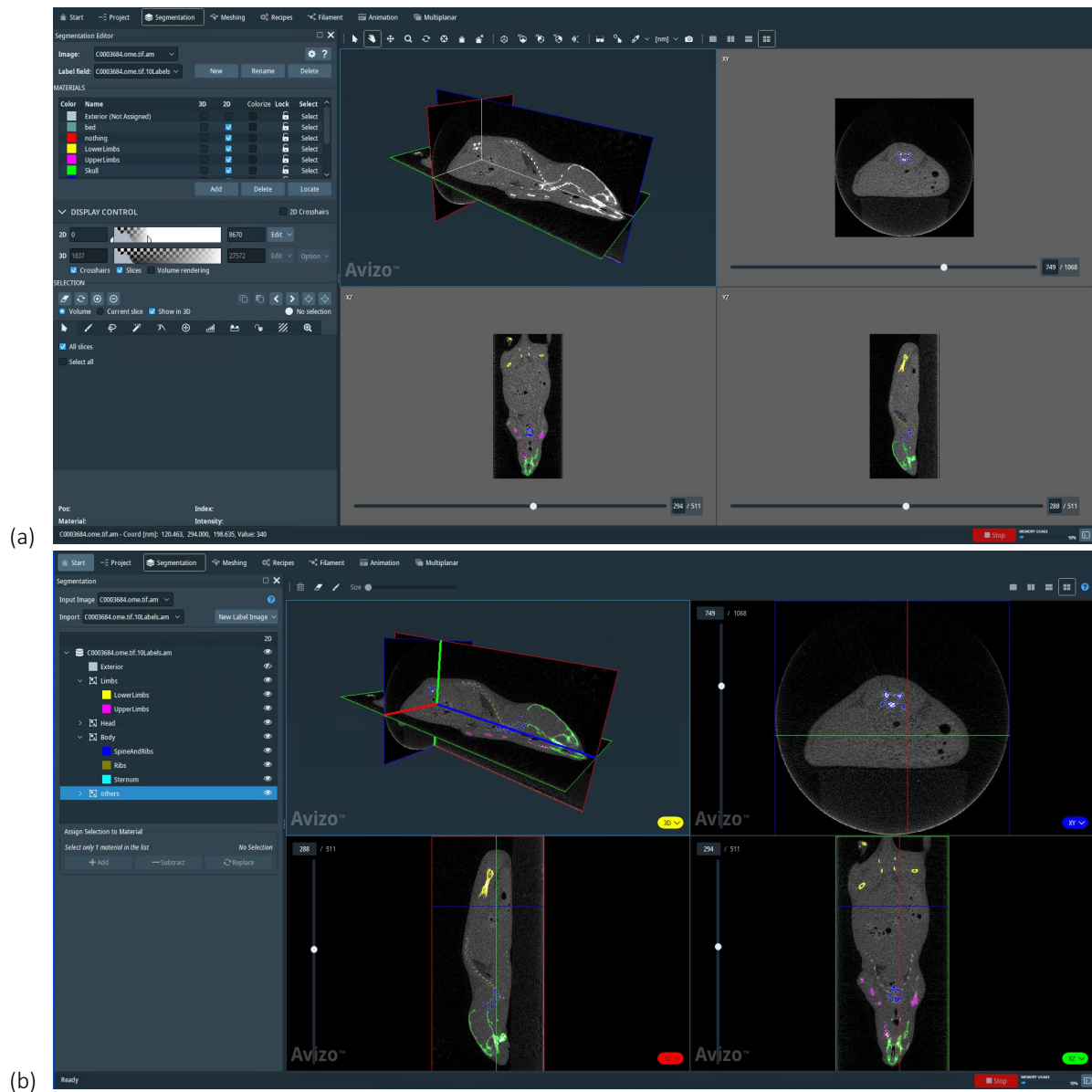


Figure 1: Snapshot of the user interface comparing the (a) Classic and (b) Segmentation+ workrooms

Avizo Software and Amira Software XDigitalVolumeCorrelation extension: Digital Volume Correlation improvements

Homogeneous mesh generation fitting the object shape for the global DVC approach

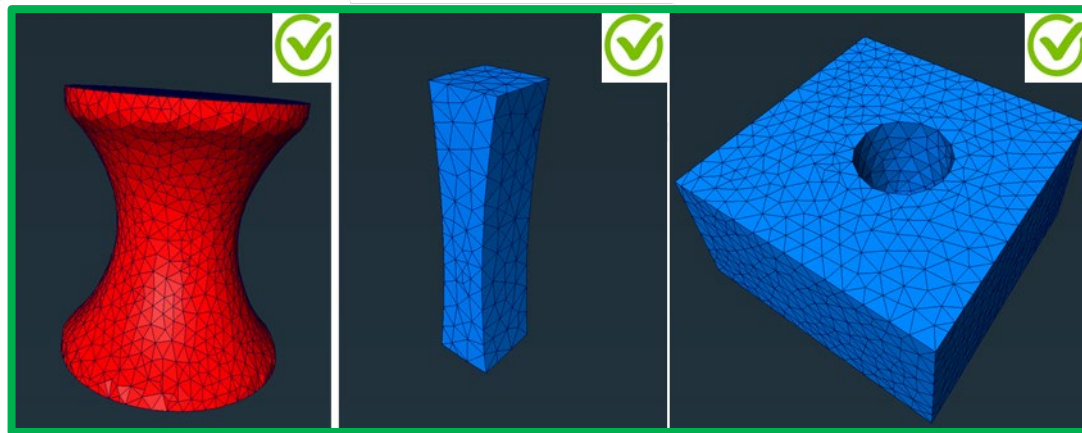
The Digital Volume Correlation (DVC) tool available in Amira-Avizo Software allows you to compute 3D full-field displacement and strain maps from volume images acquired during the deformation process of an object. DVC is an innovative, powerful contactless, bulk strain measurement technique in experimental mechanics, materials science, and biomechanics.

For a few years now, Amira-Avizo Software has offered a truly unique and complete high-performance DVC solution. One of the main differentiators of the Amira-Avizo DVC technology is the availability of the 'Global Approach' which allows for high-precision measurement of deformation phenomena.

As a first step, this Global Approach requires to build a 3D mesh that conforms at best the 3D shape of the object. Building such a quality continuous and homogeneous mesh can require some expertise and several manual steps.

The 2021.2 release of Amira-Avizo Software introduces a high-performance meshing technology that dramatically reduces the time and the complexity to build a high-quality mesh, ideal for the Global DVC Approach.

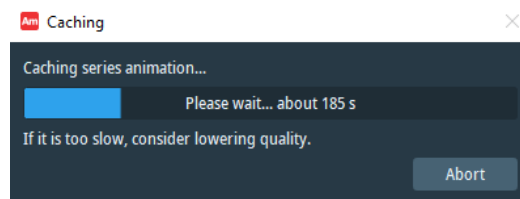
This offers full access to the most complete and powerful DVC solution even for non-expert users



Avizo Software and Amira Software Xplore5D extension: general improvements

With this release we have modified the way the first loop of animation works. Animating for the first time will always require more time as data is read from the disk before putting into the cache for the next loops of animation. Previously, the first loop was rendered like any other loop of animation, resulting in a lagging and non-interactive application until the loop was complete. With High rendering quality settings (and even Medium with long time series), it could result in multiple minutes of a non-interactive application. It was very ambiguous.

To fix that, a blocking popup is now displayed if caching requires more than a few seconds. An approximation of the time required to fill the cache is also provided. You can interrupt the caching whenever you want. The popup can be disabled with an advanced option to go back to previous behavior.



Other improvements:

- On Windows®, you can associate Smart Multichannel Series file extension (.sms) to Amira 3D or Avizo 3D. You can therefore open Amira or Avizo by double clicking on a .sms file.
- OrthoSlice and Volume Rendering are now favorite modules for SMS data type in the tool browser.
- We have improved the way we convert float dataset to .sms files with a more precise histogram computation.
- We have changed the default value for the advanced parameter Sampling Quality of the SMS Volume Rendering from 0.1 to 0.2. The impact on performance is negligible and it let you see directly your data if it is very thin (less than 10 slices).

Enhancements

Python API enhancements

A new Python dictionary is available `hx.core.HxData.parameters`. It can be used to get and set Amira Avizo 3D Data Parameters and Materials (also known as Parameter Bundle). Class `hx.core.HxViewer`, has a new `auto_redraw` property to control viewers' autoredraw. The same class `snapshot` method supports new options for offscreen rendering and to control antialiasing.

XPand uses CMake

The CMake open-source tool is now a requirement to build custom modules by mean of XPand, the C++ API for custom extensions available in Avizo and Amira 3D Pro. CMake is a de facto standard tool to define and create platform independent builds in C++. The adoption of CMakeLists.txt replaces the previous build infrastructure based on proprietary Avizo Package files.

Licensing

This release introduces new upgrade features which will allow you to update your licenses more easily when a new version is released:

- For node-locked (local) licenses, a new Upgrade button has been added in the Thermo Scientific License Manager. To benefit from this new feature, make sure you don't skip Thermo Scientific License Manager 1.6.6 installation at the end of Amira-Avizo installation.
- For floating (server) licenses, a new [Upgrade](#) menu is now available in the TLM portal.

Bio-Formats | Open Microscopy Environment (OME)

Amira-Avizo Bio-Formats readers are now based on version 6.6.0 ([XBioformat Extension](#))

Amira-Avizo Improvement Program

We have updated one of our internal reader/writer library. Here are a summary of the important modifications.

We have changed our JPEG 2000 reader, with the following impacts:

- File with extension .jpx can no more be opened with JPEG 2000 reader. Please use JPEG 2000 (Compatibility Avizo 9.0) reader instead. No impact on Open Data.
- Loading time may vary compare to previous reader.

We have improved our MRC reader and writer.

- It is now possible to choose MRC 2014 when exporting your data to MRC.
- We have simplified the MRC Stack or Volume export. There is no more a specific export for MRC volume. The differentiator between stack and volume MRC is just on the extension.
- We have fixed multiple issues with converting MRC to large data (LDA) where the orientation of your dataset was inverted, the histogram was inverted and were the Automatic Intensity Range Partitioning was not working correctly.
- We have fixed an issue were the MODE was wrongly read. The MODE is now read accordingly to the MRC version (2000 or 2014). Some data read as unsigned will be now read as signed data and vice-versa.

- We have improved our parsing of the MRC FEI metadata. We now support the bitmasks which means you will only see metadata with a bitmask set to 1 in the parameter bundle now. We also now correctly export the bitmask when export your data into an MRC file.
- Globally we are much more compliant with the MRC specification (2000 and 2014).
- We now support MRC FEI2 metadata.

Xtra Recipe Library

The following Xtras have been published or updated since the previous release notes. Pay particular attention to the product, license and OS requirements, as well as the installation instructions. Your feedback is welcome.

- [Incremental Digital Volume Correlation Tutorial](#)
- [How to Use the Image Stack Processing \(ISP\) Workroom](#)
- [How to Overlay Images Using the Color Wash Module](#)
- [How to Register and Merge Images](#)
- [How to Use the Transform Editor](#)
- [How to Create a Custom Label Colormap](#)
- [How to Change the Label Colormap to Display a Label Field](#)
- [How to Edit a Colormap from the Colormap Editor](#)
- [How to Save a Project](#)
- [How to Script the Instantiation of a Python Script Object Xtra](#)
- [Using Tcl Command Module for Multi-File OBJ Export](#)
- [More Resources on Amira-Avizo Learning Center YouTube Playlist](#)
- [Split and Merge Segments](#)

Compatibility notes

- With the announcement from RedHat to discontinuing CentOS 8 at the end of 2021, we will transition the supported Linux distribution to Ubuntu in future versions.
- We will upgrade the compiler versions required to use the XPand extension to:
 - Microsoft Visual Studio 2019 on Windows
 - gcc 9 on Linux

End of support

Mac OS discontinued since 2020.3

As previously announced, Avizo/Amira 2020.3 are the last official maintained release on MacOS platform. There has been no new product development or update on MacOS since this version.

You can still use the Mac OS versions of our software products. However, as new versions get released, we encourage you to transition to one of our supported platforms to benefit from our full support.

Operating systems

Amira-Avizo Software version 2021.2 runs on:

- Microsoft® Windows 10™ (64-bit).
- Linux x86 64 (64-bit). Supported 64-bit architecture is Intel64/AMD64 architecture. The supported Linux distribution is CentOS 7.

Avizo Software 2021.2 for Industrial Inspection runs on:

- Microsoft Windows 10 (64-bit).

To add custom extensions with Amira-Avizo XPand extension, you will need:

- Microsoft Visual Studio 2013 (VC12) Update 4 on Windows
- gcc 4.8.x on Linux CentOS 7

Solved issues

Bio-Formats	AA-25584	The reading of metadata from Bio-Format reader has been improved.
Bounding Box	AA-24793	The line width port max value is now limited to 10.
Compute Ambient Occlusion	AA-24974	The module is now able to handle data over 4GB.
DICOM	AA-24967	Writer now exports unknown tags in the same format as the input.
DVC Global Approach	AA-24363	Memory usage has been optimized.
DVC	AA-21528	Memory usage has been optimized to reduce computation time and the amount of memory required.
Generate Tetra Grid	AA-25443	The available memory information has been added to the system memory error message.
Licensing	AA-25954	AvizoInspect license now unlocks Avizo ToGo, ToGo Publisher, XMolecular and EM toolbox features.
Matlab	AA-25667	It is now possible to export data which name contains paranthesis.
Measurement	AA-26019	An empty Measurement module can now be saved and reloaded without error.
Raw Stereo	AA-16362, AA-16032	Raw Stereo (OpenGL) capabilities have been restored for workstation with compatible hardware.
Relabel by Track ID	AA-25816	Computation will now work with data containing an amount of voxels up to Int64's max value.
Separate Objects	AA-24880	The Agressive Skeleton method is now applicable on largest data with multiple labels.
Snapshot	AA-24459	An error was raised when computing the module without any input. This is not the case anymore.
Viewer gadgets	AA-24982	The display of Camera trackball and Compass tools has been improved.
MRC	AA-16481	There was sometimes errors raised with .rec files. The reader has been corrected and this is not the case anymore.
ANSYS export	AA-24052	The default extension is now .inp and it replaces the previous one .ans.

