

Release notes

PerGeos Software

Version 2019.4

Digital rock visualization, analysis and simulation

Please read these Release Notes carefully. They contain important new information about features, improvements and changes in this version of Thermo Scientific™ PerGeos Software.

We welcome your feedback regarding this version. If you encounter any problems or have any suggestions for improvement, please contact us at FRBOR.3d_hotline@thermofisher.com.

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General Enhancements and new features

Convert Image Type: Simplified Normalization

The tool Convert Image Type has been enhanced to offer a simplified interface for normalizing intensities before casting, using explicit ranges and appropriate default values. The Data Mapping port is now more explicit about the initial intensity range of the data and the effective mapping that will be realized.

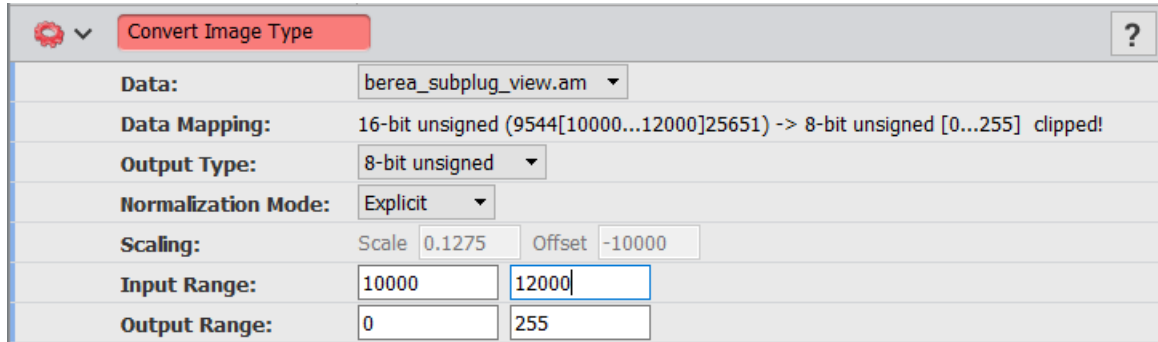


Figure 1: Capture of the enhanced Convert Image Type tool

New Colormaps

Two new colormaps have been added and are loaded by default: invertedGrayscale and volrenYellowInverted, which can be useful for 2D or 3D visualization when the background information in the image has a higher intensity than the structures of interest.

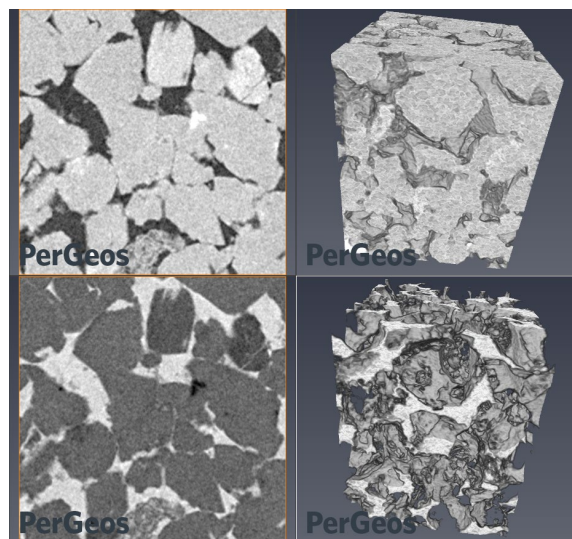


Figure 2: Berea sandstone dataset. Top: standard grayscale colormap Bottom: new invertedGrayscale colormap, left: slice display, right: volume rendering.

Python

Access to column of spreadsheet

It is now possible with the new method `HxSpreadSheetInterface.Column.asarray` to retrieve a NumPy from spreadsheet columns (generated by some compute module like Label Analysis) in order to be able to make statistical analysis for columns containing scalar values.

New Remote Procedure Call package

A new Remote Procedure Call package, named `hx.rpc`, enables to send and receive Python commands via TCP/IP sockets from a PerGeos Client to a PerGeos Server which interprets the command. In this way, you can for instance from the client side, create Python script which creates a complete compute module workflow and execute it on the server side.

Albumentations package for deep learning

The albumentations package, which enables to make fast image augmentation, is now available as standard for Python environments created with Deep Learning packages.

Compatibility notes

- The **Non-Local Means Filter** in **CPU Standard** mode and with the **Interpretation** set to **3D**, could remove small objects close to the image borders. This is now fixed but the processing is slower.
- The default values of all porosity modules (**Propagation Distance**, **Axis Propagation** and **Estimate Shortest Path**) have been changed since they were inappropriate.

Parameter	Old default value	New default value
Mask	0	255
Seed	255	-1024
Maximum Threshold	4	128

- This version no longer supports Windows 7, since Microsoft has announced the end of support of this version on January 14, 2020 (see <https://www.microsoft.com/en-us/microsoft-365/windows/end-of-windows-7-support> for details).

If you continue to use PerGeos Software on Windows 7 after support has ended, it should still work, but technical support and software updates will no longer be provided.

Operating systems

PerGeos Software version 2019.4 runs on:

- Microsoft Windows 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 7.

To add custom extensions with PerGeos XPand extension, you will need:

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

Solved issues

Abaqus Input	AA-20938	Materials are now supported when exporting in .inp format, with the following limitation: materials are exported but not their properties. Only fake properties are set, so that ABAQUS can differentiate the materials.
Align Slices	AA-21663	On Mac, the Align > Options... menu was not displayed anymore when using the Align Slice module in Edit mode. The menu has been restored in the Align drop-down menu.
Arithmetic	AA-15097	Arithmetic results were incorrect when values were over the data range. This has been fixed.
Auto Thresholding	AA-15067	The Auto Thresholding module now supports float images as input.
	AA-22131	The Auto Thresholding module did not work properly when executed with XY planes Interpretation, only the first plane was thresholded. Now all the planes are correctly thresholded.
Cylinder Slice	AA-21111	The rendering in Cylinder Slice extra viewer has been fixed for 4K/Retina screens.
DICOM reader	AA-22124	The DICOM reader now supports DICOM files with an Icon Image Sequence containing an implicit length for Pixel Data tag.
	AA-22239	The DICOM reader performance has been improved and now allows to load DICOM files which present some variation from the DICOM standard.
	AA-22237	

	AA-22373	DICOM with Little Endian Implicit Transfer Syntax containing an Icon Image sequence are now correctly read.
	AA-21790	The DICOM reader is now able to read DICOM files with private implemented sequence tag (0009, 1210).
Filter by Measure	AA-22132	The Filter by Measure module did not compute correct results when used with XY planes Interpretation. The command is now applied separately on each 2D slice of the input image.
Gaussian Filter	AA-11332	It is no longer possible to set the Standard Deviation port to a value equal to or smaller than zero.
Image Gradient	AA-12303	When using Image Gradient module with "Interpretation = 3D" , "Gradient type = Sobel" and " Gradient Options = amplitude(euclidean)" properties, the output values could present overflows (i.e., inconsistent intensities). This has been fixed and now the output range of the result is consistent with the input.
Intensity Integral	AA-6496	The Intensity Integral module now takes into account the voxel size defined by the image calibration, in accordance with the documentation and the behavior of the Volume measurement.
Label Analysis	AA-12514	Feret diameters-based measurements (e.g., Length3d, Width3d, Breadth3d, Thickness3d) could be incorrect when applied on a data with large origin coordinates. This has been fixed.
	AA-17400	The NeighborCount measurement returned incorrect results when the Minimum overlap attribute was different from 0. Now it works correctly but the computation can be slower with non-null overlap.
	AA-17369	The NeighborCount measurement has been optimized to avoid useless computation when the cut-off distance property is greater than the image diagonal.
	AA-12873	The VoxelBasedSurface measurement returned null values for labels greater than 32767. This has been fixed.
Label Interfaces	AA-12726	For some volumes the Label Interfaces module could generate straight lines artifacts on volume borders (e.g., on the XZ border faces). This has been fixed.
Licensing	AA-21476	The license checks at the application startup have been optimized in order to reduce the application startup time.

Local/Global Axes	AA-21617	Local Axes and Global Axes modules have been merged into a single module named Axes.
Logical Operations	AA-12318	<p>When applying logical operation to binary images, the result is now a binary image with min-max equal to 0...1.</p> <p>As a result of this fix, all logical operations between a binary image and an image of different type are now forbidden. Indeed, all bits before the significant bit of the binary input were considered equal to 0, which could lead to unexpected results.</p> <p>The projects saved before 2019.4 version which have logical operation modules that fall into this use case can be reloaded but tcl errors will be displayed and the result will not be calculated.</p>
	AA-17372	Using a logical operations module with two images of different types now produces an explicit error message.
Marker-Based Watershed	AA-12304	In some cases, the Marker-Based Watershed module could generate labels which were not existing in the input marker image. Now the computed result is consistent with the input image.
Matlab	AA-21315	Calculus Matlab module now supports Matlab 2019.a version.
	AA-22135	It is now possible to read large matlab data exceeding 32-bit.
Ortho Slice	AA-20921	The Ortho Slice module now supports histogram mapping type for 8-bit signed data.
Python	AA-22218	The User's Guide Python Environment and Package Manager section now documents how to download the Python Deep Learning package when the internet connection fails.
Quantification	AA-22178	For some quantification modules, temporary folders were created by default in %TEMP%/FeiProxy with ownership rights restricted to the logged user. This could generate error messages when another user would try to use the application on the same machine. This has been fixed.
Recursive Exponential Filter	AA-20439	The Recursive Exponential filter module would implicitly upgrade the output image type. This has been fixed: filtering an 8 bits image now outputs an 8 bits image instead of a 16 bits image.
Register Image	AA-17209	The performance of Register Image module has been improved.

Spreadsheet	AA-21280	Copy/paste from spreadsheets could fail depending on the copied table. This has been fixed.
	AA-21058	Using a Tcl script command to update a spreadsheet would cause an abnormal consumption of memory and time. This has been fixed.
Units	AA-20684	The incorrect display of the working unit after deleting a first loaded data has been fixed.
Volume Rendering	AA-21633	The Volume Rendering has been improved and the CPU usage is less intense, now the Volume Rendering instantiation and the camera manipulation are much more fluid.

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