

Amira-Avizo2D Software version 2023.1

Release notes

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Introduction

This document covers the most important new features, improvements, and changes in this version of Thermo Scientific™ Amira-Avizo2D Software. In addition, you will find a list of new Xtras including video tutorials, recipes, and workflows which have been published on [amira-avizo.com](https://www.thermo.com/amira-avizo.com) since the previous release.

We value your feedback. If you encounter any problems or have any suggestions for improvement, do not hesitate to [contact us](#).

Image Recipes

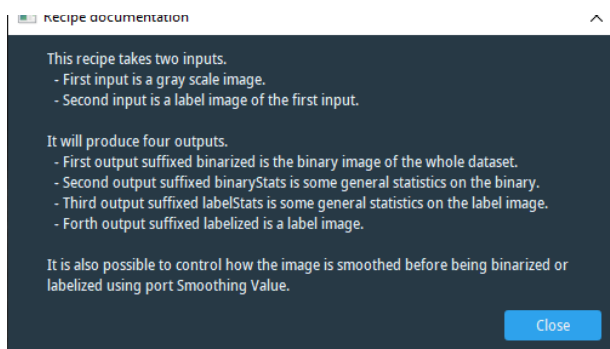
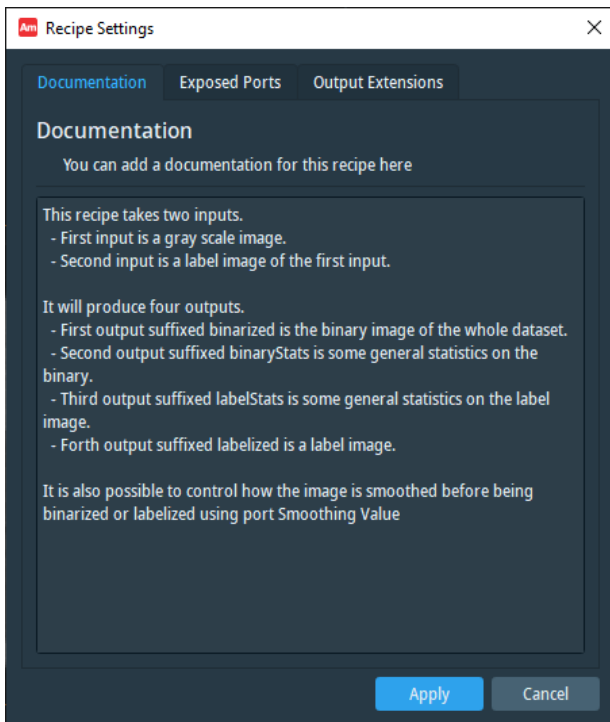
Documenting Image Recipes

The Image Recipe Designer workroom now contains a *Recipe Settings* dialog to help you document your recipes and make them easier to use.



The recipe settings will let you:

- Add general documentation



- Adjust the names of exposed ports

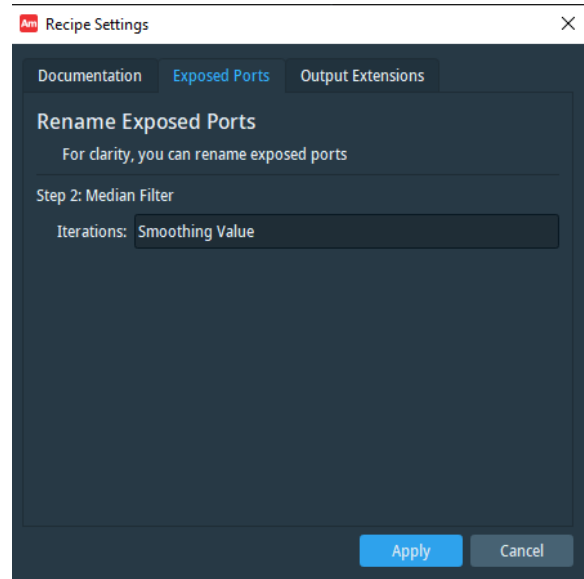
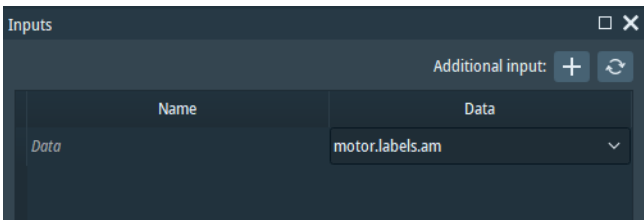
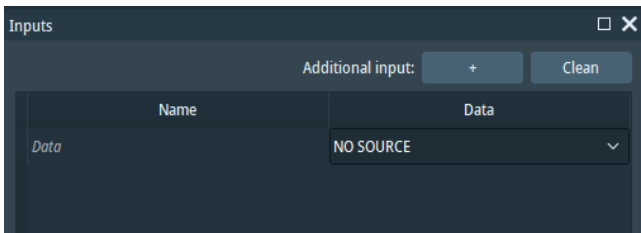


Image Recipe Designer User Interface

We have also added the following improvements:

- You can now remove a step by pressing the *Delete* key, which displays a confirmation dialog
- The interface for adding or removing additional inputs to an image processing recipe has been improved
- The name of the recipe in the Image Recipe Designer is now the filename without the file extension

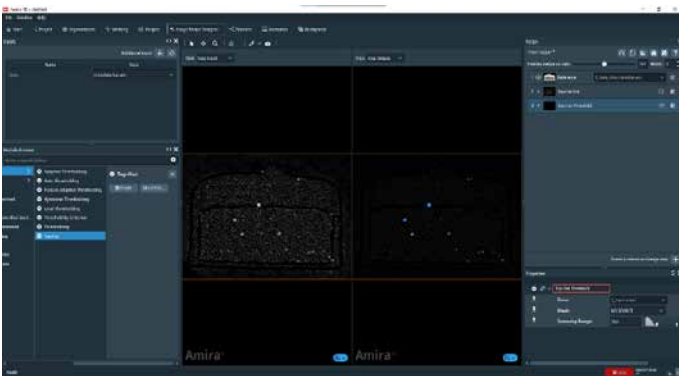


New modules in Image Recipe Designer

With each release, we are expanding the number of modules supported by Image Recipe Designer. This release includes three new modules:

- Remove Island

We have also modified the **Top-Hat** module within Image Recipe Designer to make it easier to use. Now, creating a **Top-Hat** module will add two steps to the image recipe: initialization of the **Top-Hat** and thresholding. Please refer to the *Compatibility notes* section if you previously created recipes using **Top-Hat**.



OS requirements: Windows 10 (64-bit)

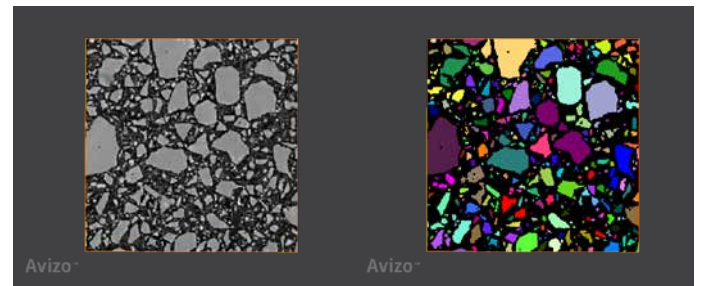
Licensing: No restrictions

New Modules

Hierarchical Watershed Segmentation

This module implements the watershed algorithm, enabling segmentation of images into meaningful regions. The traditional challenge with watershed segmentation is the adjustment of the parameter controlling the fusion of adjacent regions. Starting from either the local minima or maxima of the input image, the first execution of this module computes a hierarchy of catchment basins simulating water flooding in the landscape and stores it in a tree structure. Once this structure is computed, you can quickly adjust the threshold criterion that controls how adjacent regions are being merged and interactively identify the optimal trade-off.

This module replaces a previous implementation from the **Hierarchical Watershed** module, which is now discontinued.



Hierarchical watershed segmentation applied to a dataset of a rock sample.

As with the previous module, it has two main use cases:

- Implement more control on object separation by applying this module on a distance map from a binary image of structures that are in contact (e.g., densely packed particles or cells, pore space)
- Segmentation of structures separated by relatively salient boundaries, such as membrane-marked samples in fluorescence imaging, boundaries revealed by a filter such as gradient magnitude, or membrane enhancement

OS requirements: Windows 10 (64-bit)

Licensing: No restrictions

Remove Islands

This module supports post processing of label images by removing small regions, or “islands.” An island is defined as a connected component containing a number of voxels less than or equal to a specified value. Islands can be relabeled to the predominant neighboring label, depending on the number of neighboring labels and the fraction of surface of interface shared with these neighbors.

OS requirements: Windows 10 (64-bit)

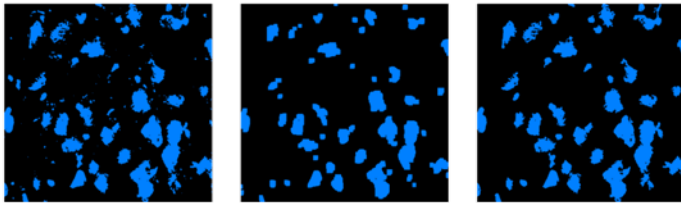
Licensing: No restrictions

Closing by Reconstruction, Opening by Reconstruction

A closing (resp. opening) by reconstruction consists in applying a dilation (resp. erosion) followed by a morphological reconstruction.

In the binary case, closing by reconstruction can be used for filling small holes without modifying edges of the objects.

In the grayscale case, closing by reconstruction can be used for performing a Top Hat by reconstruction, which allows you to detect dark, small structures without getting artifacts from the boundary concavities of large structures.



Original image (left), binary opening (middle), and binary opening by reconstruction (right).

OS requirements: Windows 10 (64-bit)

Licensing: No restrictions

Operating Systems

Amira-Avizo2D Analyzer and Trainer run on:

- Microsoft Windows 10 (64-bit).
- Microsoft Windows 11 (64-bit)

Our products are tested on the following configurations:

Platform	GPU	Driver number
Windows 10	NVidia Tesla M60	512.78
Windows 11	NVidia RTX A4500	528.02

Compatibility Notes

Hierarchical Watershed

This module will be discontinued in version 2023.1 and replaced by the **Hierarchical Watershed Segmentation** module. Previous projects using the deprecated module will still be usable, but a warning will be issued. We strongly suggest updating them with the new module.

Top-Hat Module

The previous Top-Hat module in Image Recipe Designer has been discontinued and is now replaced by initialization and thresholding steps. While existing image recipes using the old module will still work, we strongly suggest updating them with the new module.

Amira-Avizo2D Labler runs on:

- Microsoft Windows 10 (64-bit).

Resolved issues

Name	ID	Description
Convert Image Type	AA-27809	32-bit data with negative values has been managed to avoid failure when converting it to 8-bit or 16-bit label.
Image Recipe Designer	AA-28191	When switching from label to grayscale with the Convert Image Type module in the Image Recipe Designer, the colormap of the data was mishandled and could lead to a bad display of the result. This is not the case anymore.
Ortho Slice (LDA)	AA-28333	When the adjust view option is checked ON and the input data is a Multi-Channel Field or SMS, there is no longer View All when changing channels selector.
Parameter Editor	AA-28137	Parameters are now correctly handled when Remove All is requested.
Tiff reader	AA-27919	2D Tiff file size is now well handled.

Learn more at thermofisher.com/amira-avizo