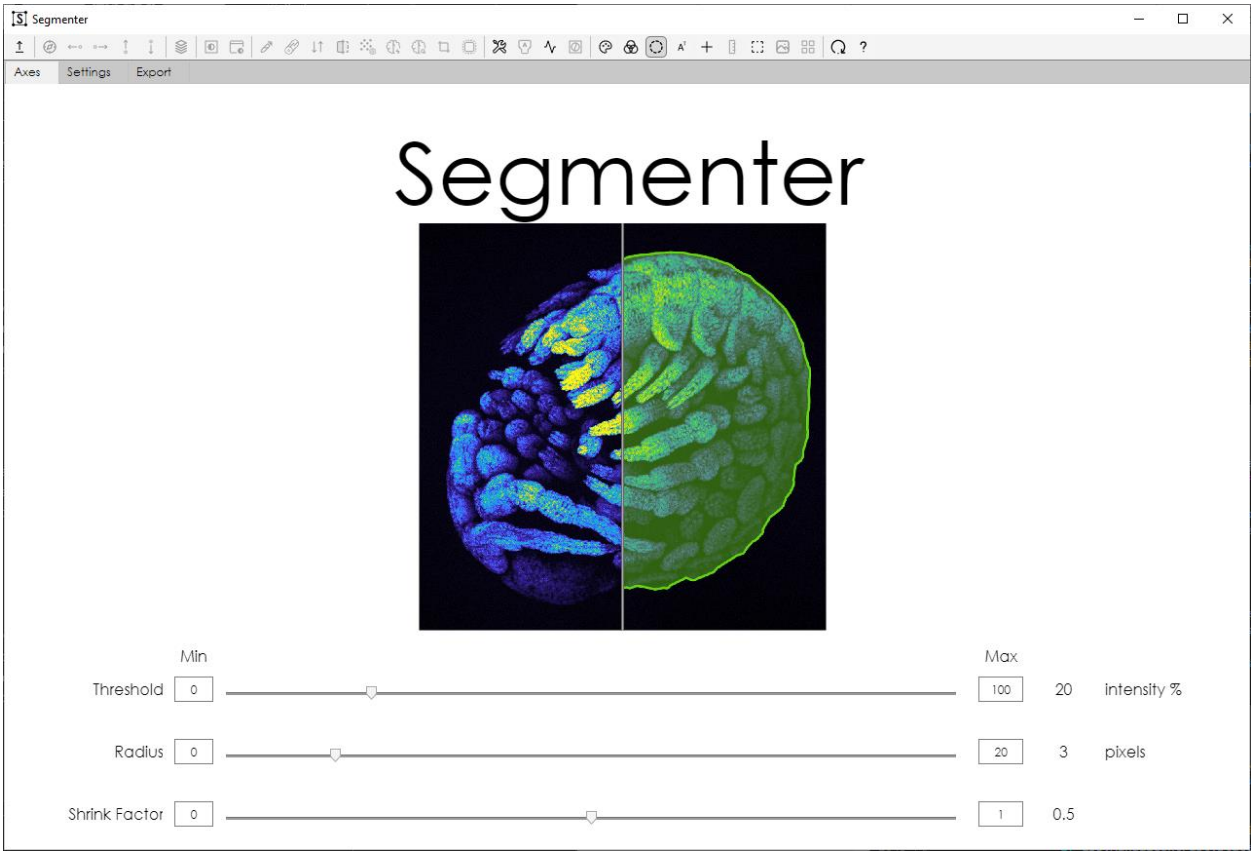
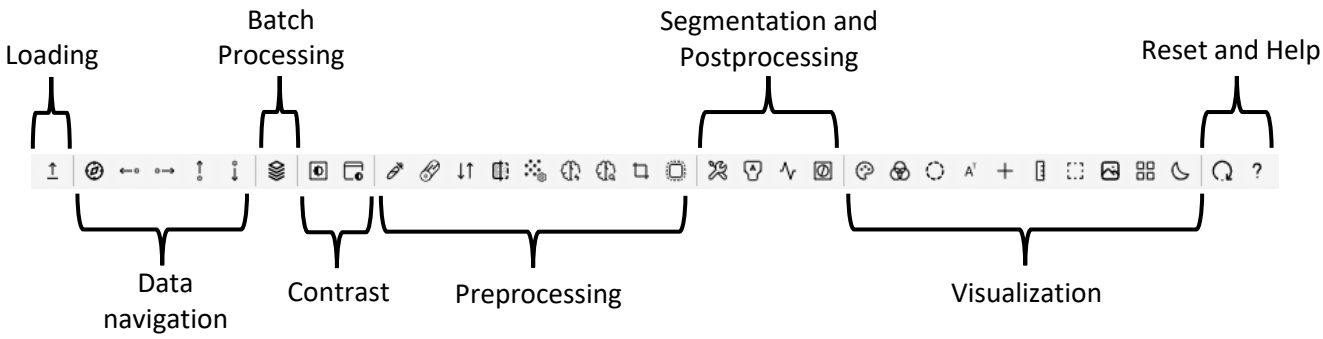
Region of Interest (ROI) Segmentation Graphical User Interface (GUI) Features

Layout



Toolbar



Loading

↥ - Launches interface for file selection. Data can be up to 4-dimensional if saved in an M-data file (.mat).

Data Navigation

- Instantly navigate to a specified timepoint and/or slice in your data

- Move to previous timepoint in a timeseries

- Move to next timepoint in a timeseries

- Move to previous slice in a volume

- Move to next slice in a volume

Batch Processing

- Preprocessing steps, segmentation method selected, and active contours settings as currently selected are applied to all timepoints and slices. Only usable when more than one slice and/or timepoint is available.

Contrast

- Auto contrast toggle. When on, color limits will be computed as the bottom 1%-ile and top 99%-ile of the median filtered image.

- Manual contrast toggle. The user is prompted to set the color limits via a GUI displaying a histogram of the pixels. These limits are then applied to subsequently loaded images. If toggled off, the default color limits are reinstated as the minimum and maximum pixel values of the image.

Preprocessing

Preprocessing steps are listed in the order in which they occur. Most can be toggled on/off and some either launch another tool or allow the user to select a method for the given preprocessing step.

- The color distance transform GUI is launched to allow user to select a target color from a color image. This tool will allow the engine to then process the image to have pixel values represent their proximity to the target color.

- Log scale the image

- Invert polarity of image

- Denoise toggle. When on, data will be denoised by the selected method. If one is not already set, the user is prompted to select one of the available options.

- Denoise method selection allows user to change the denoising method.

- Neural network toggle. When on, images will be preprocessed by a neural network and the activation layer output will be the image that the engine operates on.

- Neural network selection allows user to load in available networks to preprocess data

- Crop image via a cropping GUI. Cropping the image will allow for faster lazy loading since the image server in the GUI will only load up the specified region as it loads a single 2D image from higher dimensional data files.

- Boundary taper tool allows user to create a boundary from which the engine will taper to zero at the image edge.

Segmentation and postprocessing

- Change parametric segmentation method. By default, a thresholding method is preloaded and there are some additional options available for the user to select from.

- Auto params will trigger the engine to calculate parameters that might yield an approximate segmentation.

- Active contours will compute active contours on the segmentation result from the parametric method to further refine boundary. Configuration can be adjusted in the settings tab.

- Masking tool will be launched to allow the user to manually edit the segmentation. See GUI tools section below for more info on how to use.

Visualization

- Colormap selection allows user to visualize the image with false color based on pixel intensity.

- Contour color selection allows user to select a color for the contour of the segmentation ROI.

- Contour toggle will allow user to turn the outline of the ROI contour on/off.

- Major and minor axes plot toggle allows user to visualize the major and minor moments of inertia of the segmented ROI.

- The colorbar toggle will allow users to see a colorbar which shows the color to pixel intensity correspondence above the image display.

- Overlay toggle. Will show the image region that has been segmented as the ROI.

- View parametric segmentation method processing steps. If selected parametric segmentation method is a multistep, sequential method, the output of each step will be visualized in a figure window with identifying information.

- Toggle auxiliary image view. Will show what the image looks like with preprocessing steps applied prior to feeding into the parametric segmentation method.

- Toggle dark/light mode for GUI

Reset

- Reset parameter values to default values and reset methods to defaults.

Help

- Help button will launch an html document with information on the GUI, functionality, and algorithms used.