Nanotate Tool

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Usage: navigate to http://nanotatetool.ga using a web browser. This is a temporary website used for testing the application. Once the testing phase is complete the application will be installed on a Nanotomy server.

Workflow

(1) Upload a base image on the **Image manager screen** (Fig. 1) by selecting a file and clicking “Upload image”.

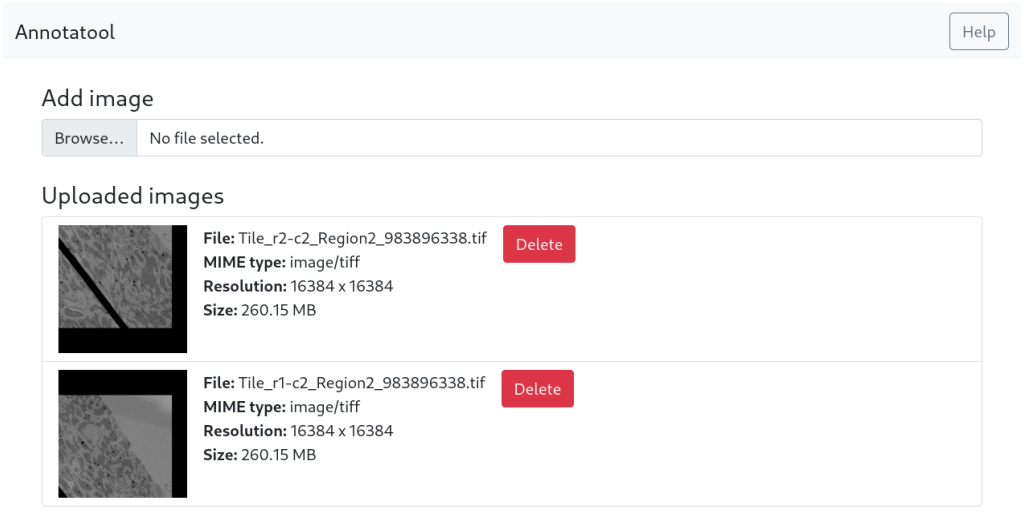


Figure 1: the image manager screen

(2) Select the base image by clicking its thumbnail. This will open the **Segmentation mask manager screen** (Fig. 2).

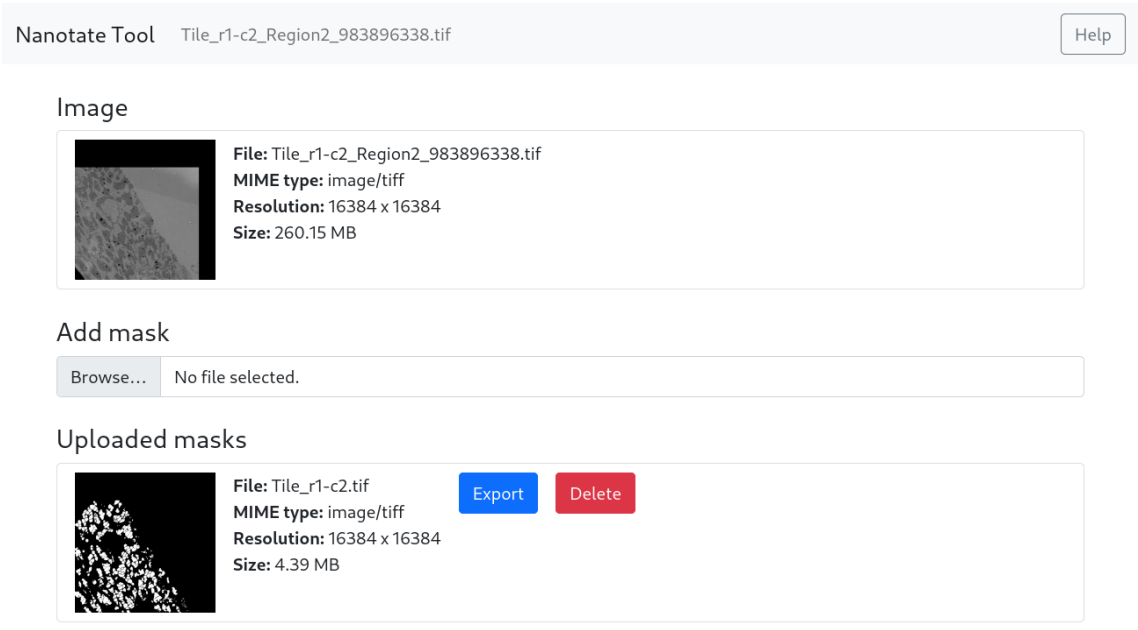


Figure 2: the segmentation mask manager screen

(3) Upload a mask image by selecting a file and clicking “Upload image”.
(4) Select the mask image by clicking its thumbnail. This will open the **Annotation screen** (Fig. 3).

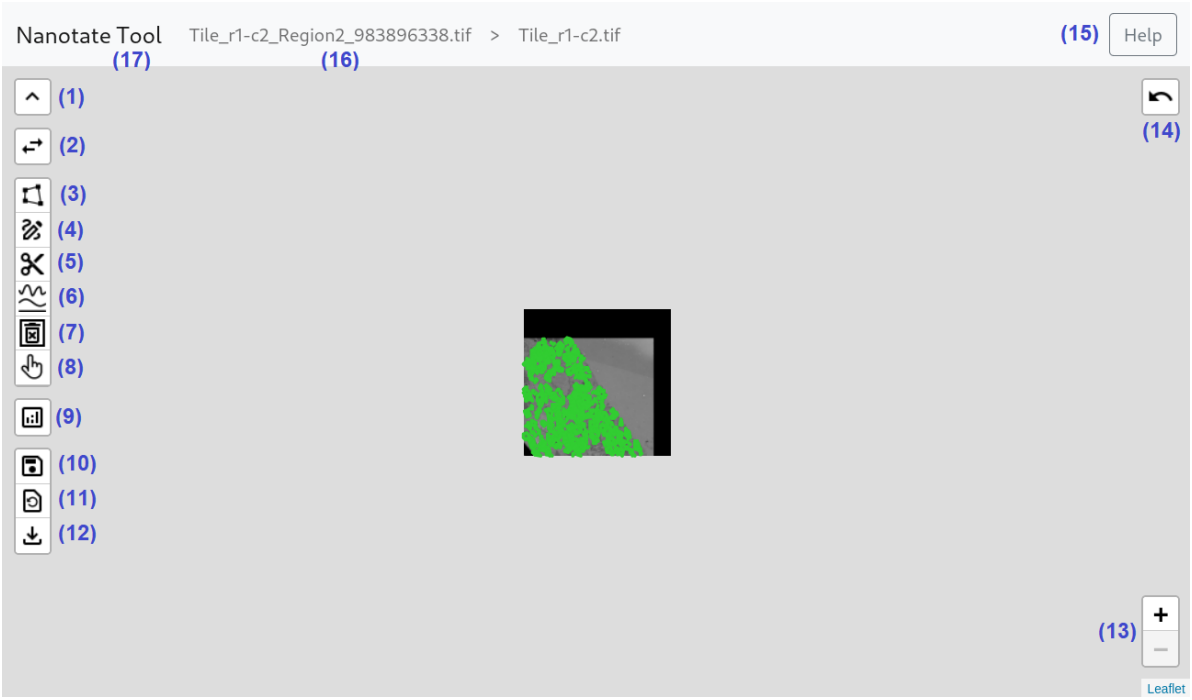


Figure 3: the annotation screen

(5) On the annotation screen, the base image is shown overlaid by the mask image. Use the mouse cursor to perform the desired changes:
    (a) Pan the image by clicking and dragging. Zoom by scrolling the mouse wheel or by using the zoom buttons in the bottom right (Fig. 3 buttons 13)
    (b) Open or close the split viewer. (Fig. 3 button 2)
    This opens the base image in a separate viewer on the left.
    (c) Select individual segments by clicking them.
    This opens a popup window. (Fig. 4)
        - Segments can be graded in terms of true positives, false positives and false negatives using the respective buttons. (Fig. 4 buttons 1) Segments are true positives by default.
        - Segments can be edited using the “Edit” button. (Fig. 4 button 2) Individual vertices can be dragged to a new position. A vertice can be removed by right clicking it. The button label changes to “Finish edit” to indicate that edit mode is active. Click this button to finish editing and exit edit mode.
        - Segments can be simplified using the “Simplify” button. (Fig. 4 button 3)
        This process can be repeated multiple times.
        - Use the “Remove” button to remove a segment. (Fig. 4 button 4)
        - The “Remove holes” button can be used to remove

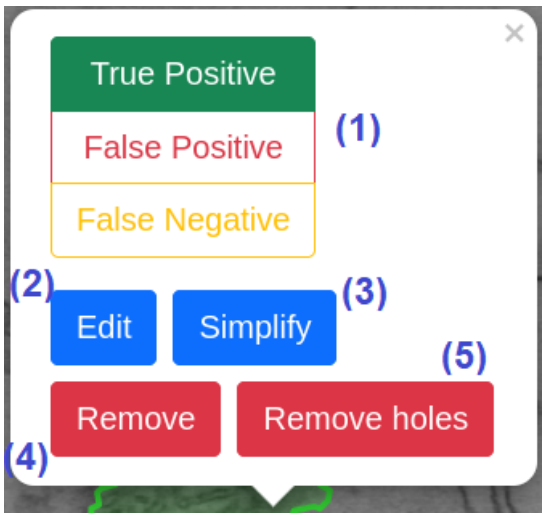


Figure 4: segment popup

all holes from a segment. (Fig 4 button 5)

(d) Draw a new segment with a polygon tool. (Fig. 3 button 3)
The button is highlighted when drawing mode is activated. Press the button again to cancel the drawing and exit draw mode. Use the “Remove last vertex” button to remove the last-added vertex.

(e) Draw a new segment with a freehand-drawing tool. (Fig. 3 button 4)
The button is highlighted when drawing mode is activated. Press the button again to exit freehand-draw mode.

(f) Cut a segment by drawing a polygon which will be subtracted from all segments it intersects. (Fig. 3 button 5)
This can also be used to split a segment into two segments.
The button is highlighted when cut mode is activated. Press the button again to cancel the cutting and exit cut mode.

(g) Simplify all segments (reduce vertex and edge count) for easier editing. (Fig. 3 button 6)

(h) Remove holes in all segments. (Fig. 3 button 7)

(i) Select multiple segments. (Fig. 3 button 8)
The button is highlighted when multiple selection mode is activated. Press the button again to exit multiple selection mode.
In multiple selection mode, the following buttons are available:

- Merge selected segments (Fig. 5 button 1)
  This joins overlapping selected segments into one segment.
- Create a convex hull of selected segments (Fig. 5 button 2)
  This creates a single segment out of the convex hull of all selected segments.
- Simplify selected segments (Fig. 5 button 3)
- Remove holes in selected segments (Fig. 5 button 4)
- Remove selected segments (Fig. 5 button 5)

Figure 5: multiple selection mode buttons

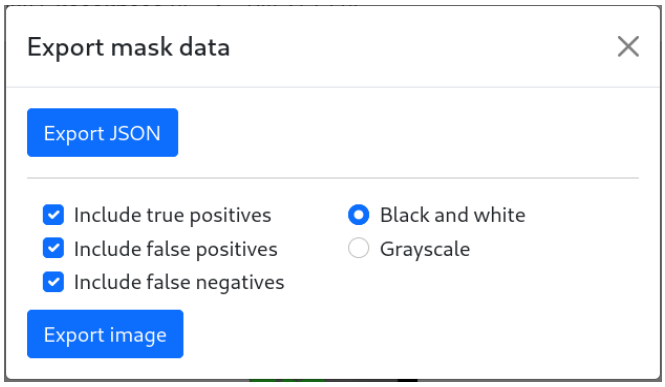
(j) Show statistics. (Fig. 3 button 9)

(k) Save all changes. (Fig. 3 button 10)

(l) Restore the original mask. (Fig. 3 button 11)
This will undo all changes and remove all grading information.
This cannot be undone!

(m) Export the edited mask. (Fig. 3 button 12)
This will open the **Mask export screen**. (Fig. 6)
From there, the modified segmentation mask can be exported in two formats:

- As a JSON file, a textual file format for programmatic use.
- As an image. The checkboxes allow including or excluding true positives, false positives and false negatives. There is also an option to export the image as grayscale, which separates true positive, false



positive and false negative segments using levels of grayscale coloring. *Figure 6: the mask export screen*

(6) Edits (d) through (h), edits to individual segments, and edits made in multiple selection mode can be reversed using the Undo button in the top-right. (Fig. 3 button 14)
There is no limit to the number of Undo operations.
(7) Return to the Mask manager screen at any time by using the browser back button or by clicking the name of the selected base image in the top menu bar. (Fig. 3 button 16)
(8) Return to the Image manager screen at any time using the browser back button or by clicking the application logo in the top menu bar. (Fig. 3 button 17)
(9) Click the help button to show a quick overview of the program functionality. (Fig. 3 button 15)