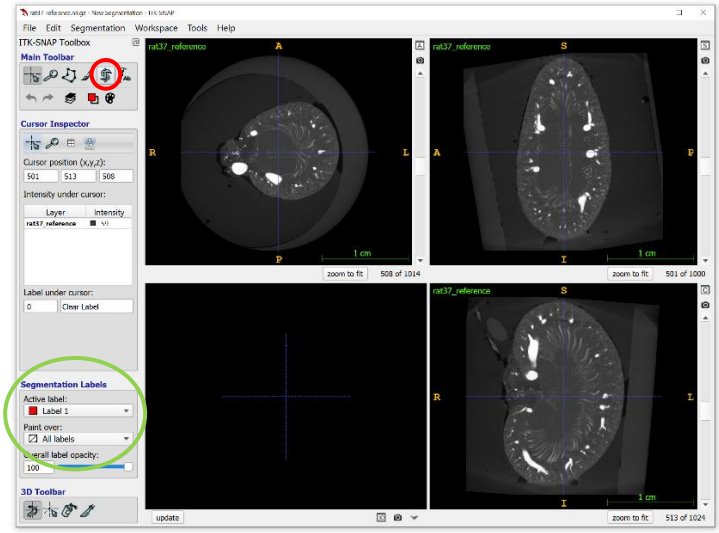
Guide ITK-SNAP

Topic: Object segmentation using active contour with thresholding

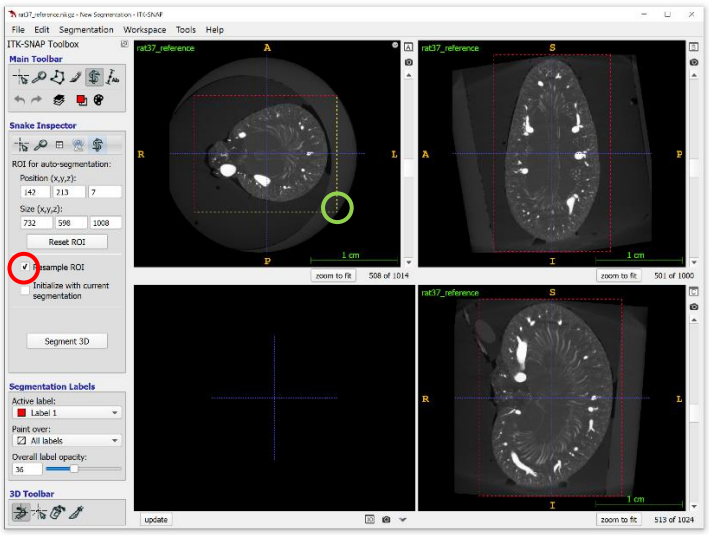
Step 1: Set-up

- Load image
- Label set-up (green circle):
  - ➢ Choose label – 1 is usually a good option
  - ➢ Choose label "Paint Over" – "All labels" or "Clear labels"
- Click on "Active Contour" module (red circle)



Step 2: ROI selection

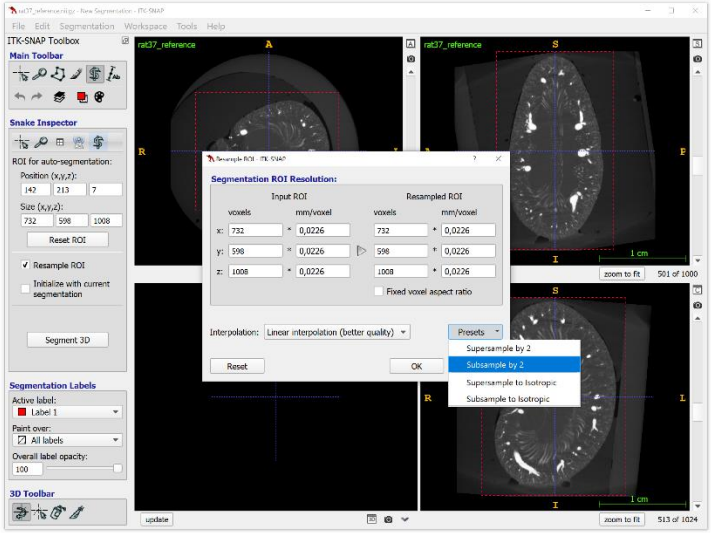
- Select Region of Interest (ROI) by cliking and dragging the red dashed borders in all 3 views (green circle)
- Downsampling the ROI may be a good idea to speed up the process - mark check box if desired (red circle)
- Click on "Segment 3D"



Step 2.1: Downsampling

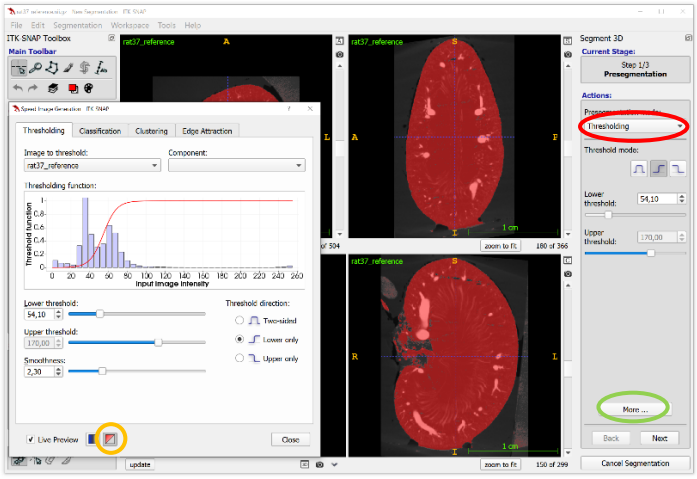
Only appears if "Resample ROI" was ticked on

- Select options for downsampling:
  - ➢ Choose interpolation – "Linear" is usually desired
  - ➢ The "Presets" menu contain some decent standard options.



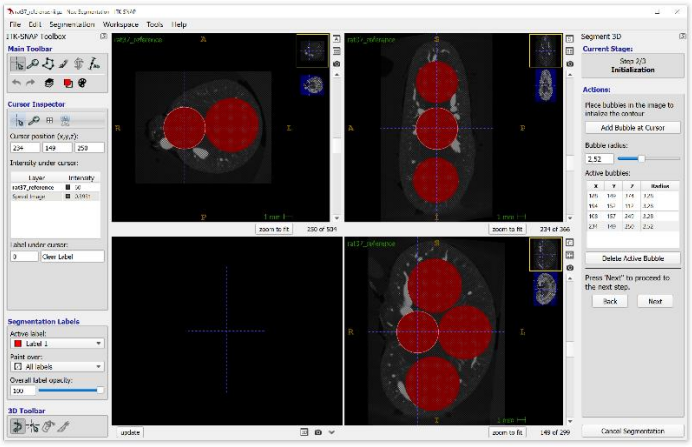
Step 3: Cost image set-up

- Choose ‘filtering’ method (red circle) – for this guide “Thresholding”
- Click “More” (green circle)
- Click the live preview overlay icon (orange circle). In this view mode, image regions in ‘red’ are the ones the segmentation will include.



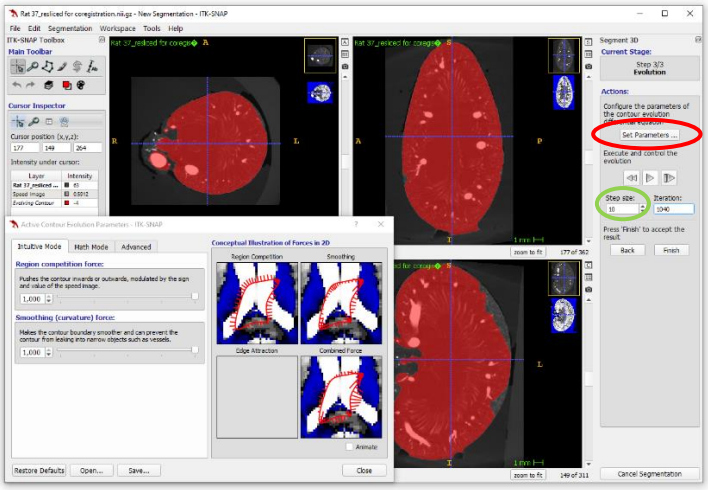
Step 4: Initiate segmentation

- Place one or more bubbles in the object of interest
- Adjust their radius



Step 5: Run active contour

- Click “Set Parameters”:
  - ➢ Choose expansion ‘rate’ – 1 is usually fine
  - ➢ Choose smoothing ‘rate’
- Run segmentations:
  - ➢ Choose “Step size” (green) – 1 is usually too low and slow
  - ➢ Start the iterations
  - ➢ Stop when satisfied – NB: there is NO automatic stop
  - ➢ Click ‘Finish’

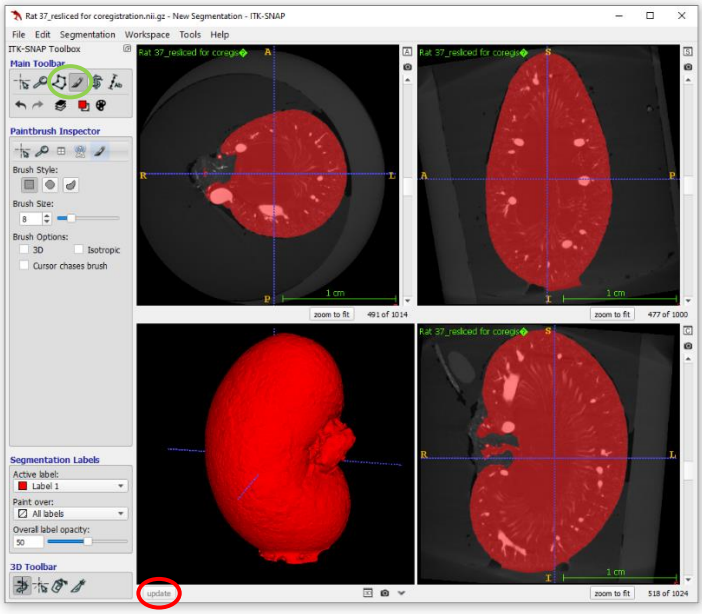


Tip: Not satisfied? Start the active contour module (step 2), but tick on the “Initialize with current segmentation”.

Step 6: Postprocessing

Look through the slides to check the result. For a 3D view, click “Update” (red).

Small mistakes can be fixed with the manual brush or polygon tool (green). Beware of time spent – trying to make surfaces smooth in 3D is time-consuming.



Step 7: Export

Once satisfied save the segmentation mask to the disc. In the menu-bar choose “Segmentation” (red circle) and then “Save Segmentation Image”.

Choose location and filename.

It is recommended to use compression (i.e. add ‘.gz’ as file extension) for mask (binary/label volumes) as the compress every efficiently.