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# **A Tutorial for RSS in Slicer**

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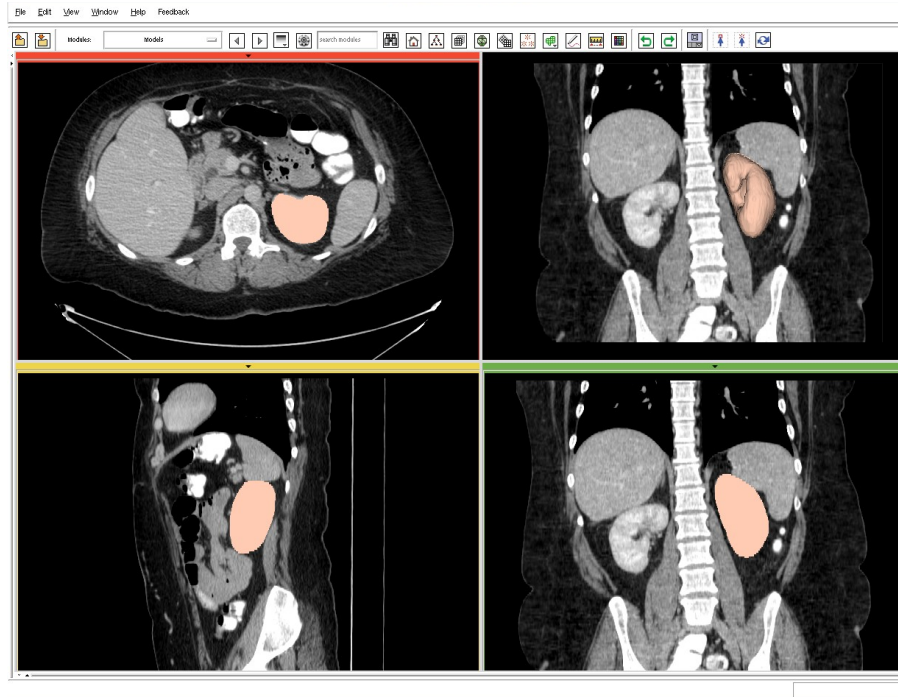
NA-MIC Tutorial Contest: Summer 2010

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# Learning Objective

- How to use:  
RSS (Robust Statistics Segmenter) in Slicer 3.6





# Material

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- This tutorial requires the installation of the **Slicer3.6 release** and the tutorial dataset. They are available at the following locations:
  
- **Slicer3.6** download page  
<http://www.slicer.org/pages/Downloads/>
  
- **Tutorial dataset:**  
[http://wiki.na-mic.org/Wiki/images/2/20/RSSData\\_TutorialContestSummer2010.zip](http://wiki.na-mic.org/Wiki/images/2/20/RSSData_TutorialContestSummer2010.zip)

**Disclaimer:** *It is the responsibility of the user of Slicer to comply with both the terms of the license and with the applicable laws, regulations, and rules.*



# Platform

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- Developed on Linux 64
- Tested on
  - Linux 64/32
  - Mac
  - Windows XP 32 (I don't have Win64 ...)




# Overview

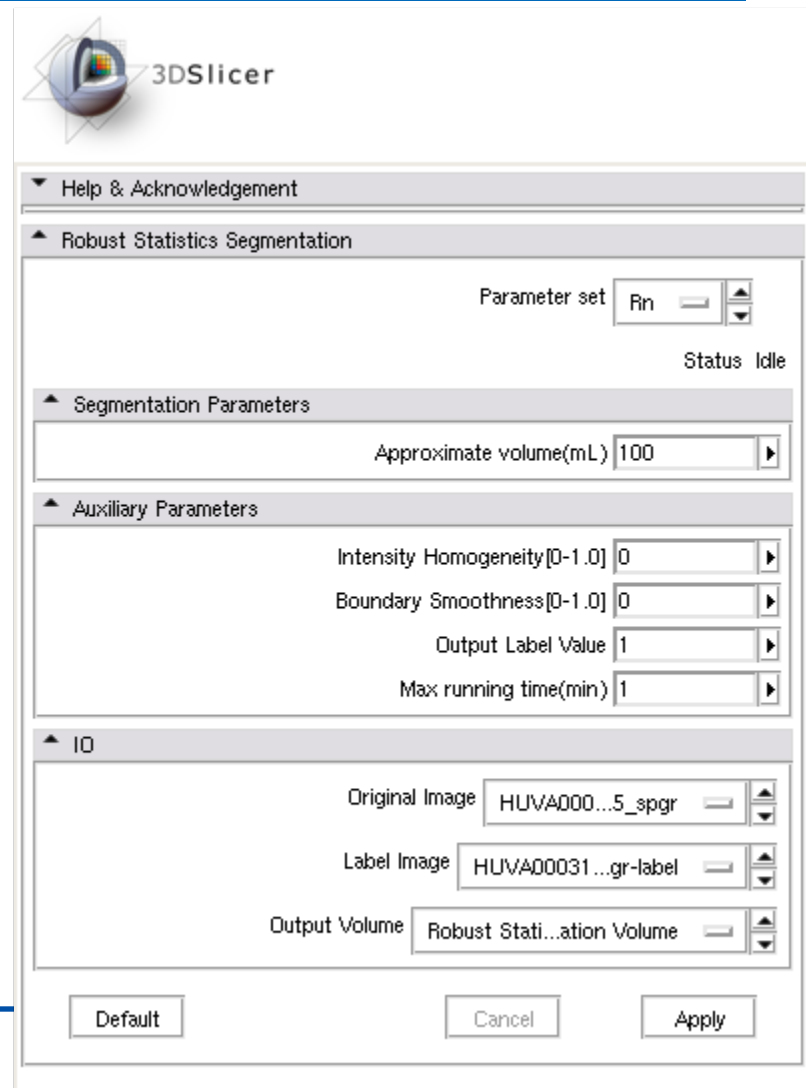
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- Basic using steps
  - First try
- How to tune it
  - What if not satisfying
- What's not for
  - Cases may need other tools



# Basic usage, 1/4

- Slicer 3.6
- Module
  - Segmentation
    - Robust Statistics Segmentation
- Module panel 



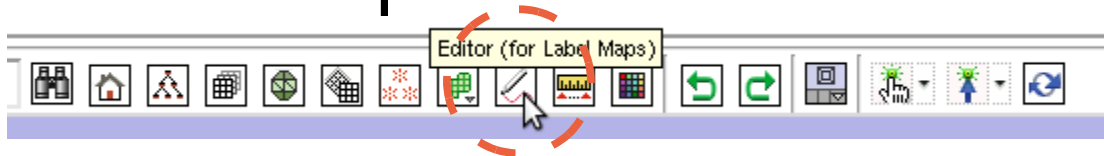


# Basic usage, 2/4

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- Load in target image
  - Slicer3/Applications/CLI/RobustStatisticsSegmenter/grayscale.nrrd
  - <http://www.spl.harvard.edu/publications/item/view/1180>
    - Tumorbase.zip at page bottom, case 3

- Label map in Editor module

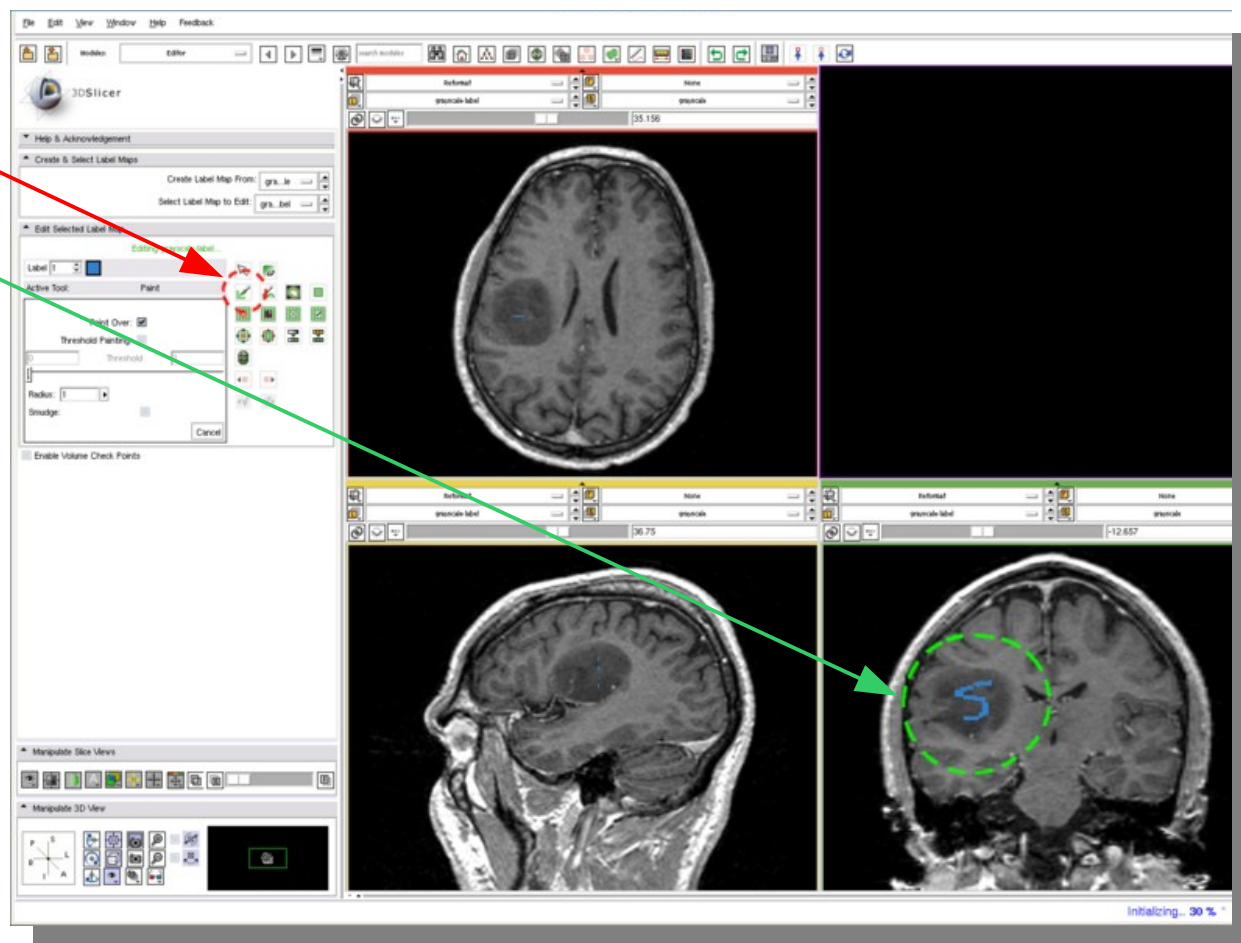


- In the editor, draw in the object  
(next page)



# Basic usage, 3/4

- Use
- Draw

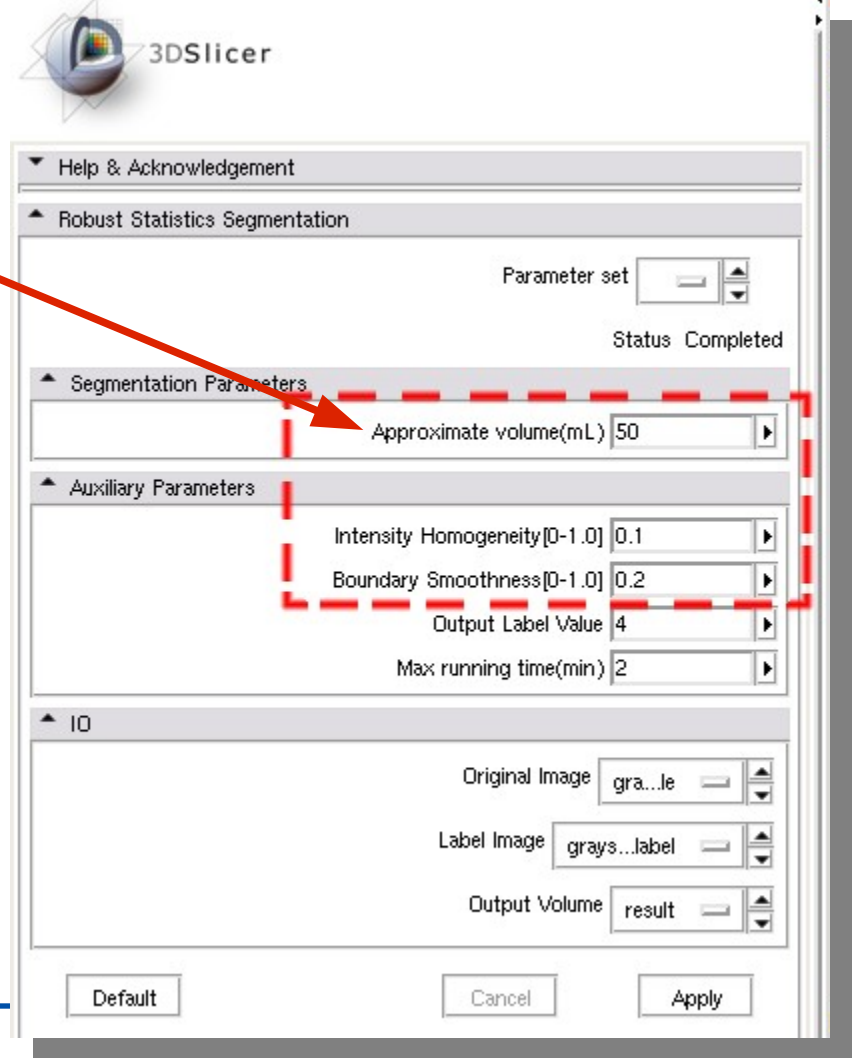






# Basic usage, 4/4

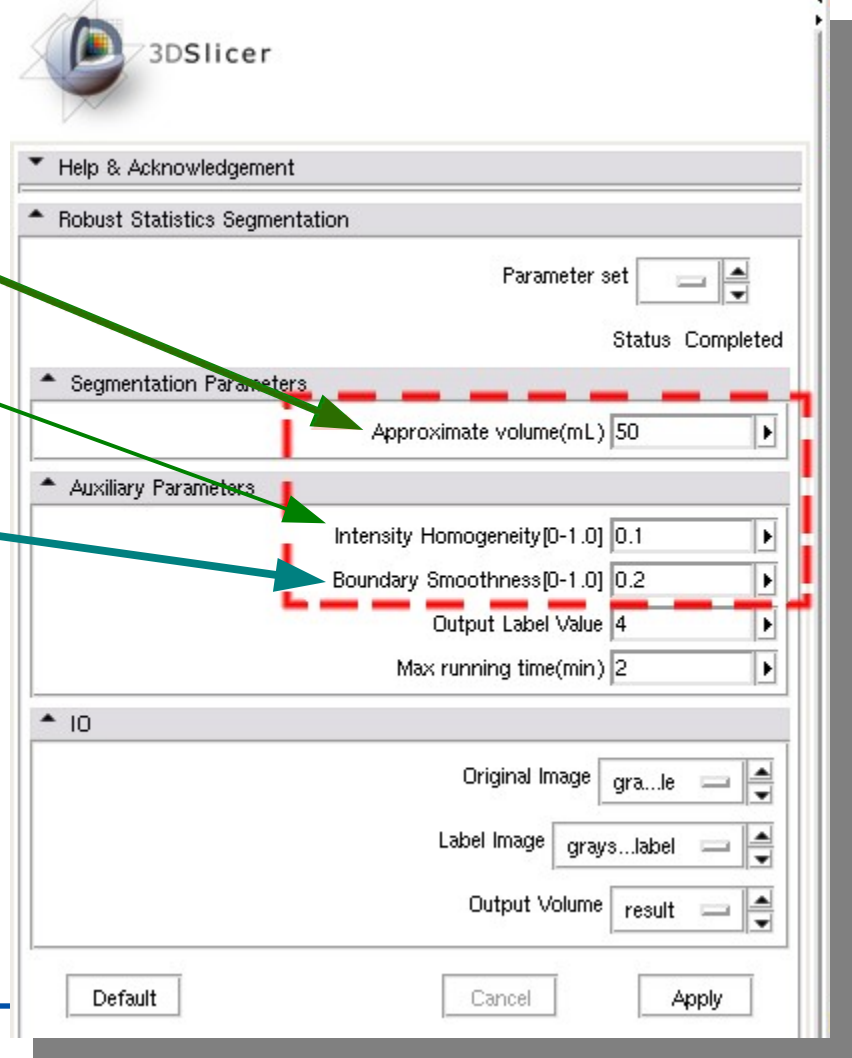
- Volume limit
- Intensity homogeneity
- Smoothness
- Target image
- Label image
- “Create new volume”





# Basic usage, 4/4

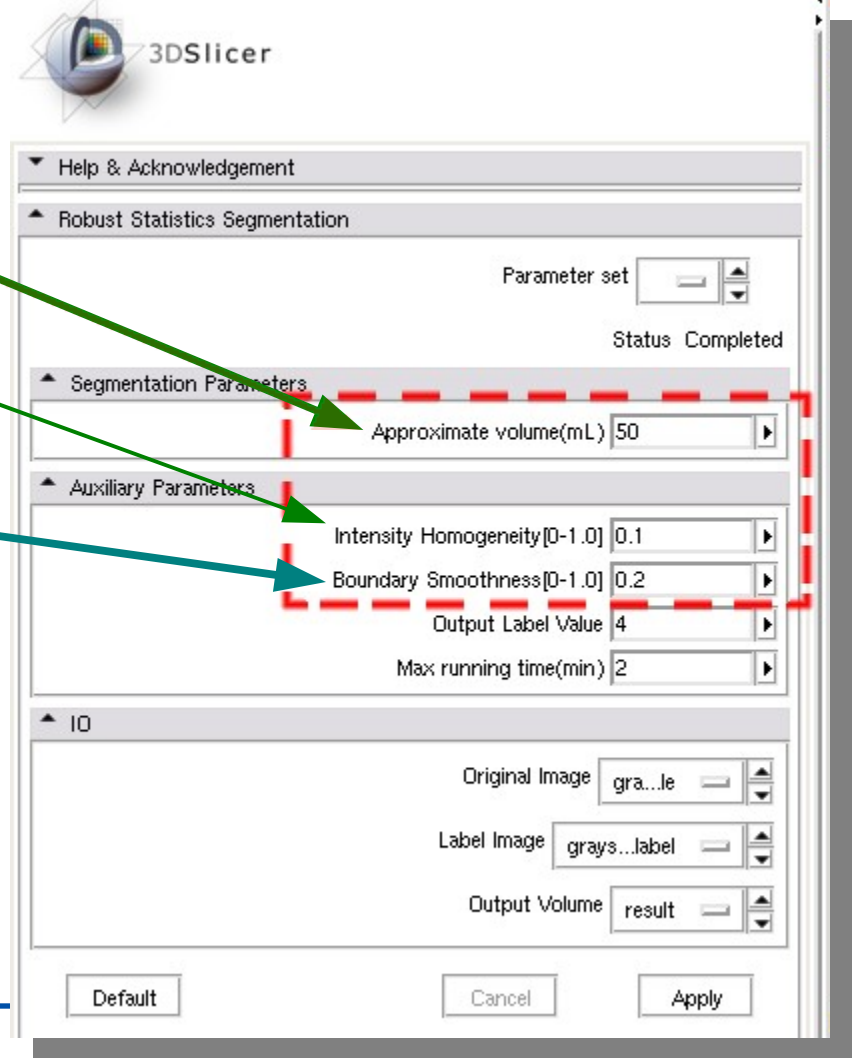
- Volume limit
- Intensity homogeneity
- Smoothness
- Target image
- Label image
- “Create new volume”





# Basic usage, 4/4

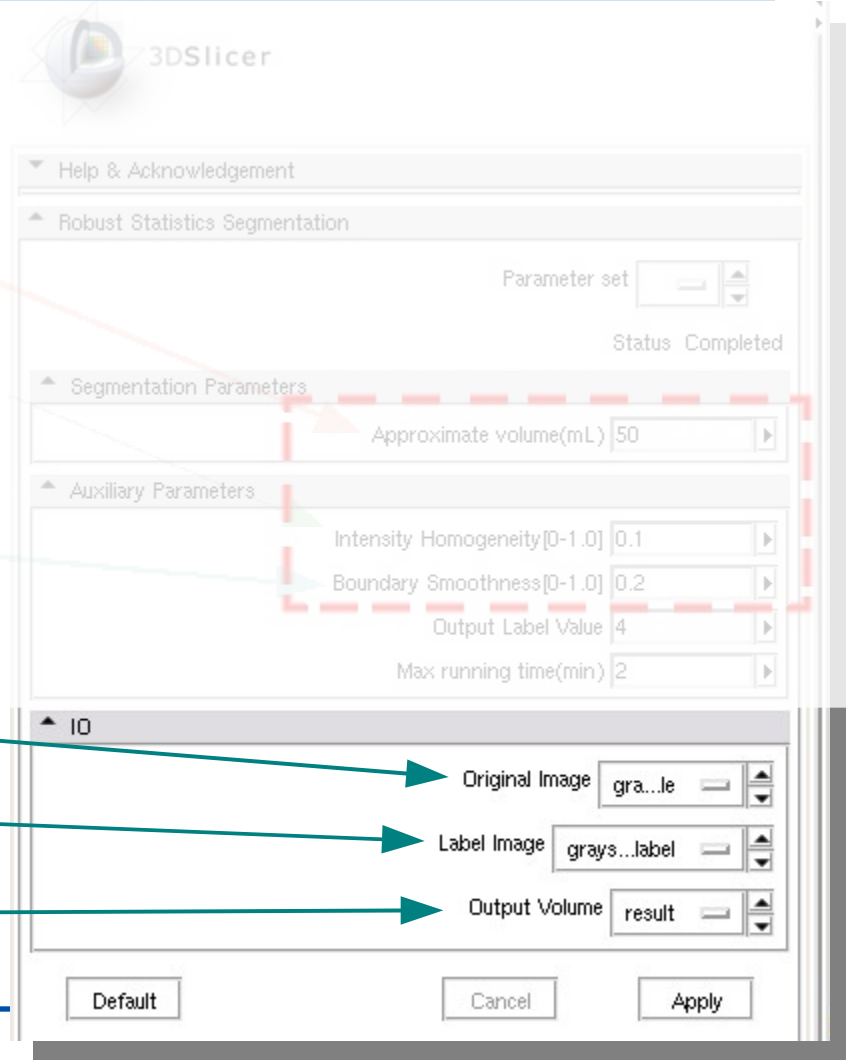
- Volume limit
- Intensity homogeneity
- Smoothness
- Use default if not sure
- Target image
- Label image
- “Create new volume”





# Basic usage, 4/4

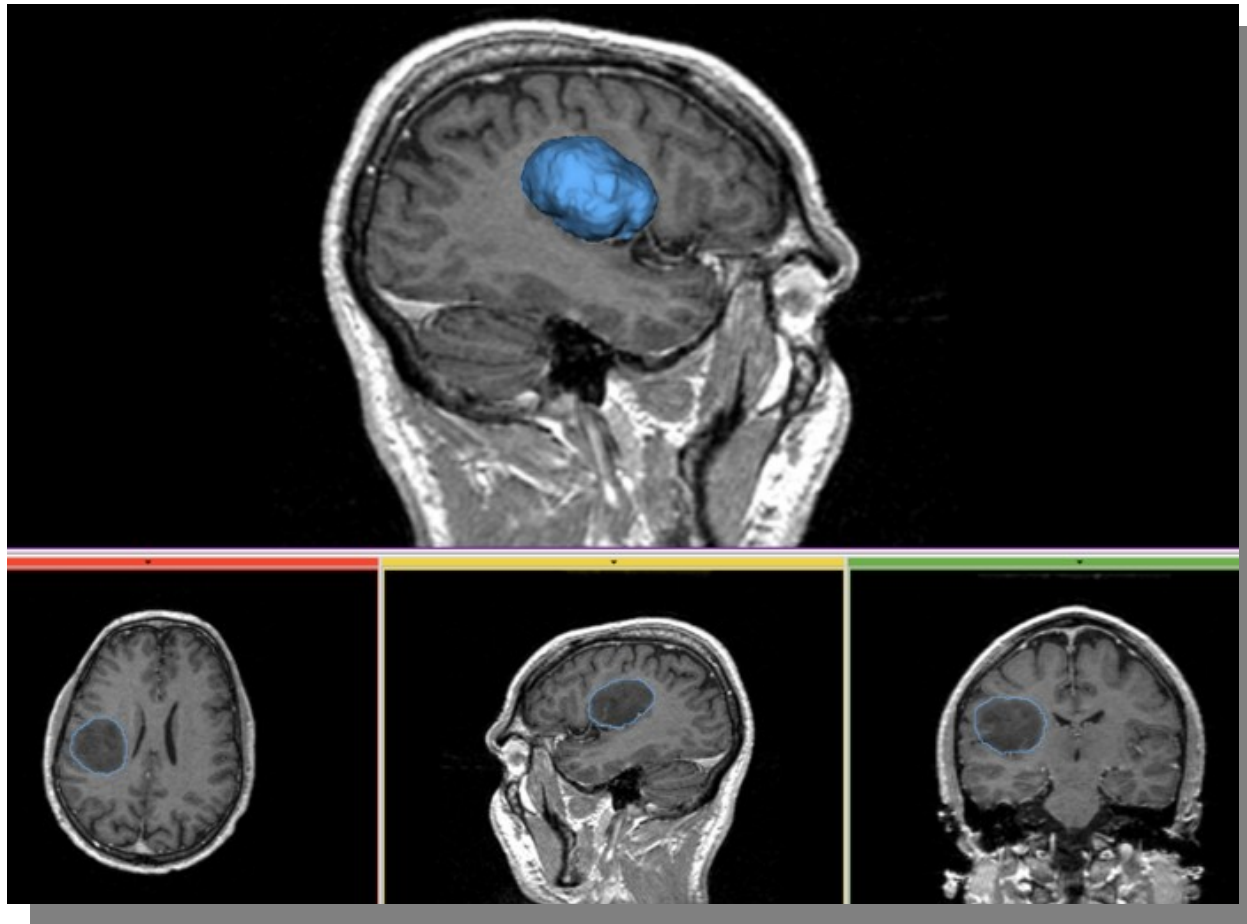
- Volume limit
- Intensity homogeneity
- Smoothness
- Target image
- Label image
- “Create new volume”





# Wait 2.5 seconds...

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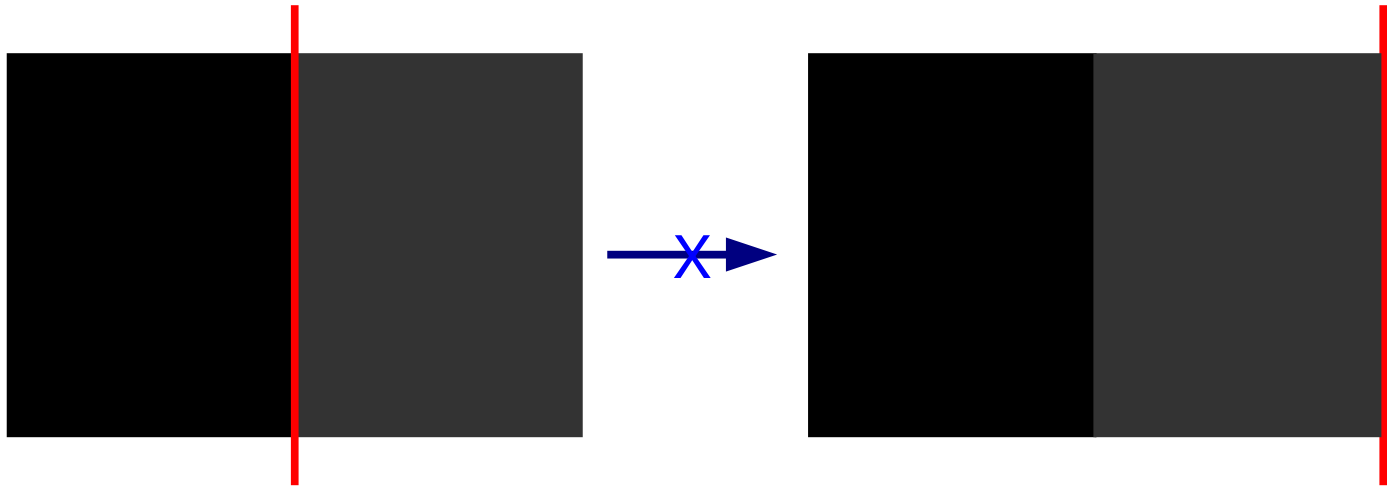




# Fine tune, 1/2

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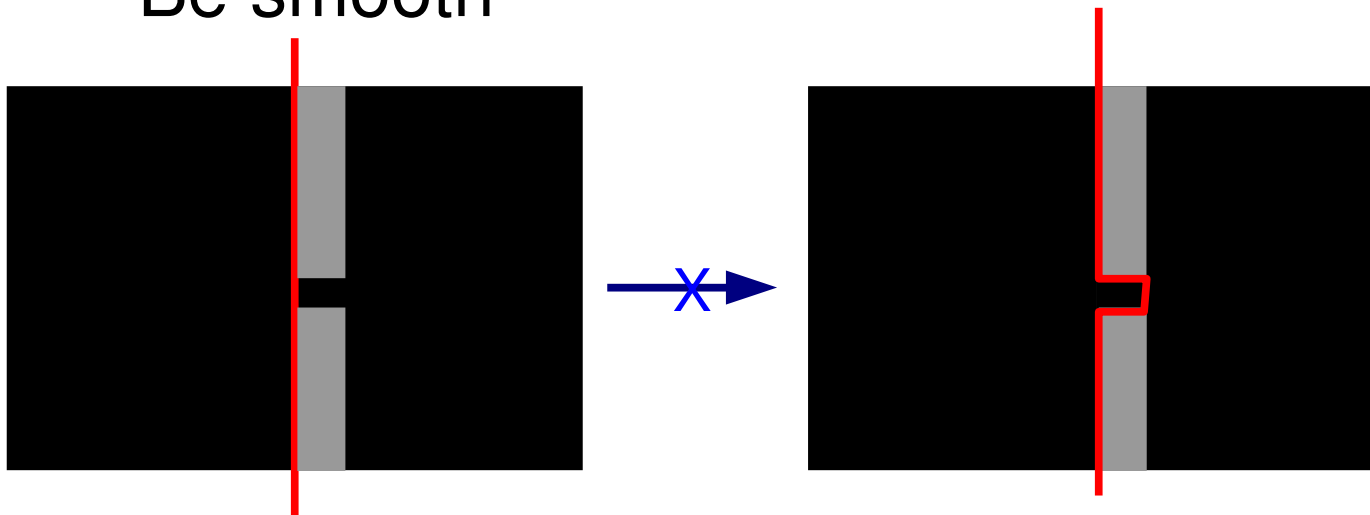
- **Intensity homogeneity  $\sim 1$**  means:
  - Homogeneous intensity in the target
  - Prevent leakage to *similar intensity region*
  - Be strict





# Fine tune, 2/2

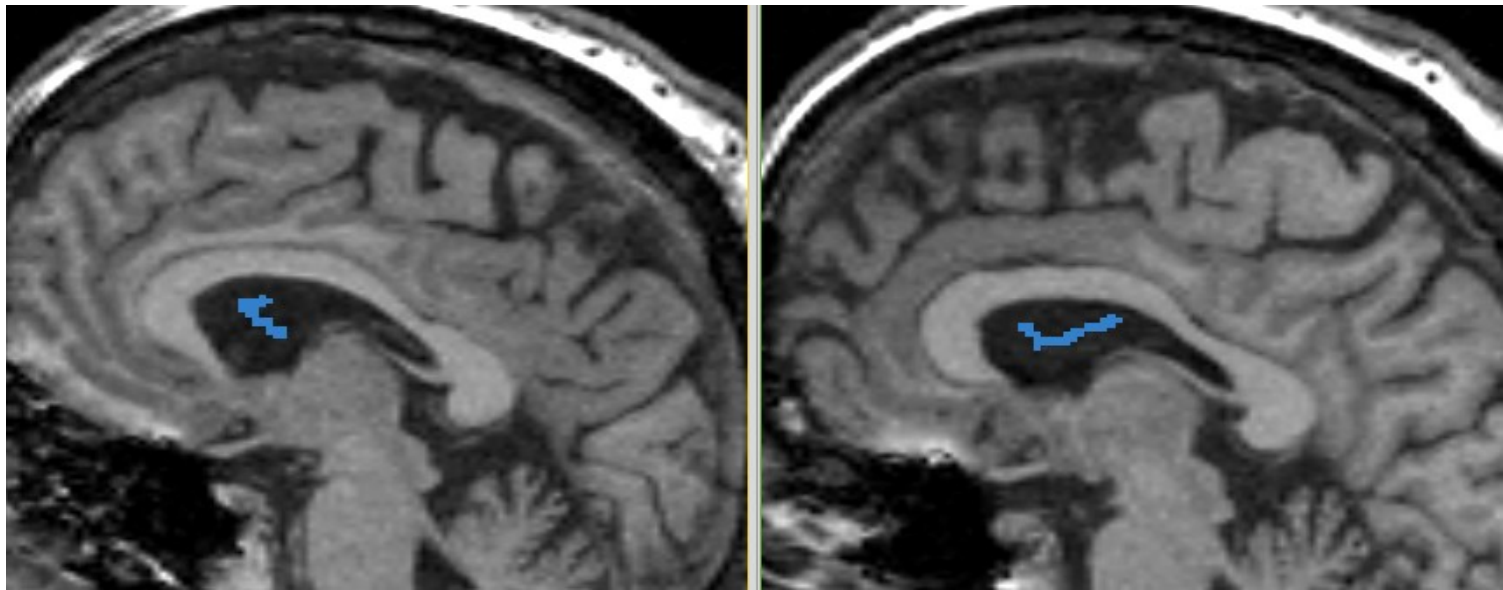
- **Boundary smoothness  $\sim 1$**  means:
  - Boundary is smooth
  - Prevent leakage *through a thin gap*
  - Be smooth





# More examples, ventricle

- MRI
  - HUVA12611577\_spgr.nrrd
  - Labels: in two sagittal slices

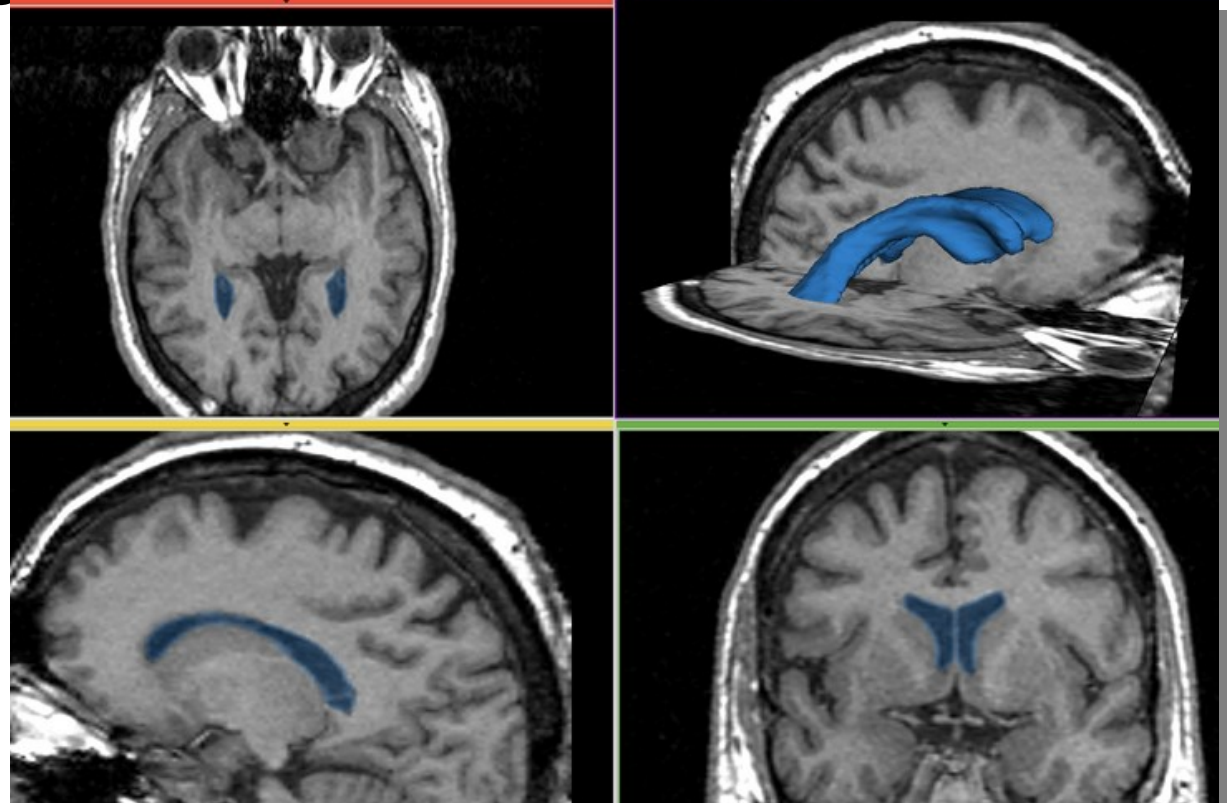






# More examples, ventricle

- Parameters
  - Vol: 30ml
  - IH: 0.02
  - BS: 0
- 2.5 sec





# More example, aorta

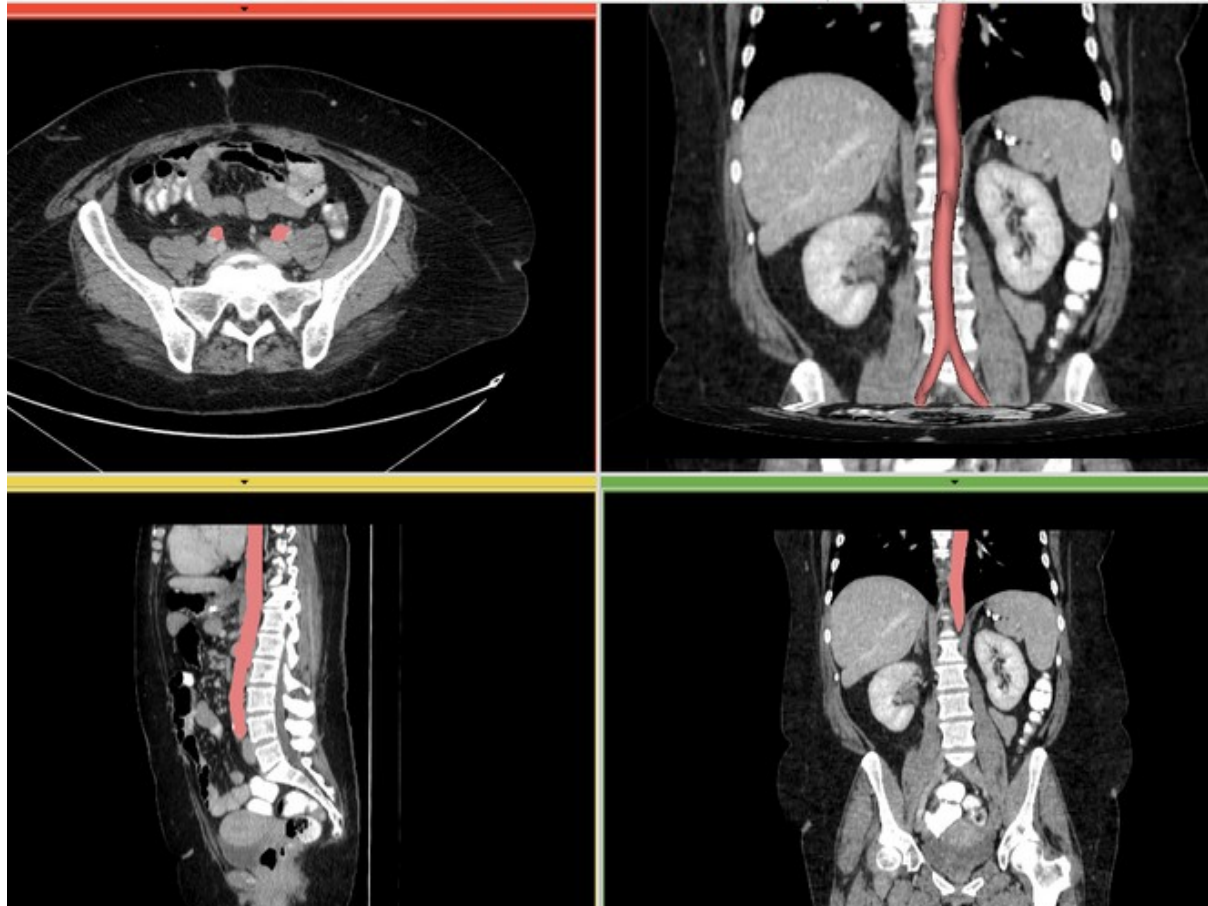
- CT
  - IMCT.nrrd
- Label
  - 1 sagittal slice
  - Along center line





# More example, aorta

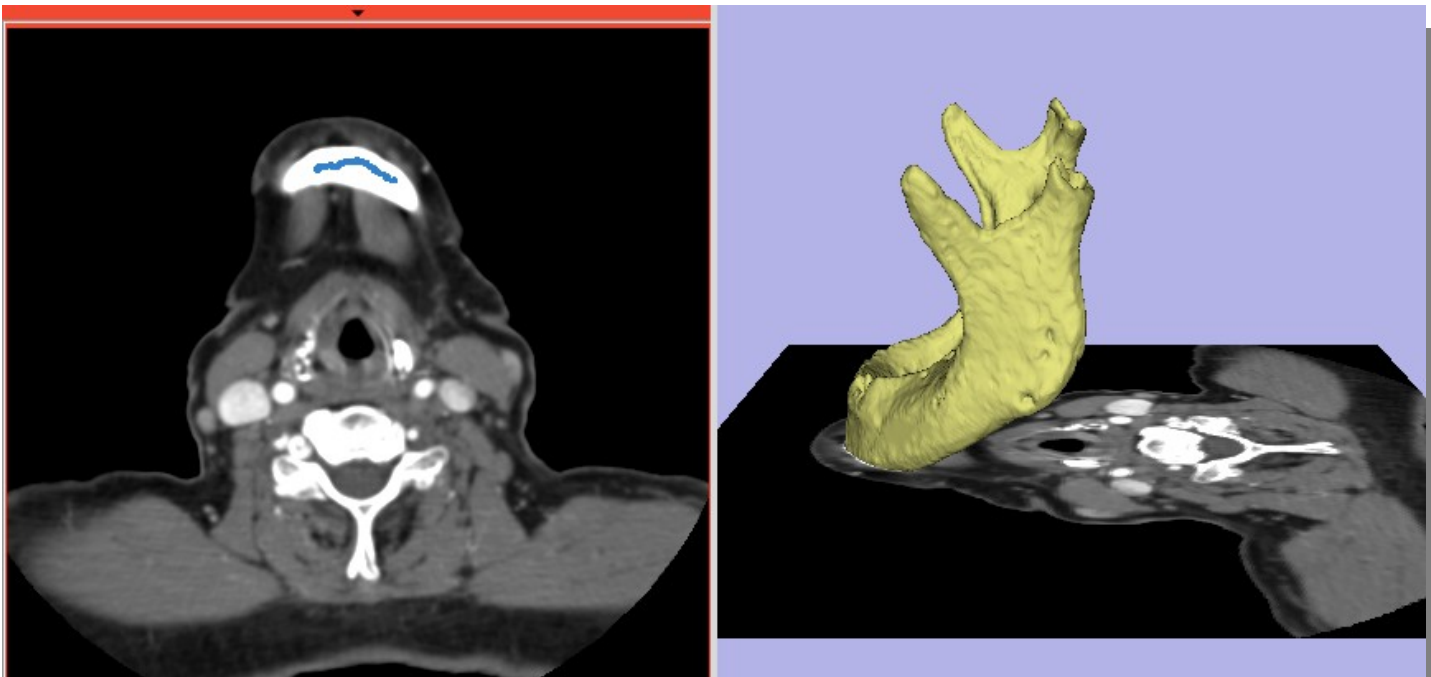
- Parameters
  - Vol: 60ml
  - IH: 1.0
  - BS: 0
- 12 sec





# More example, mandible

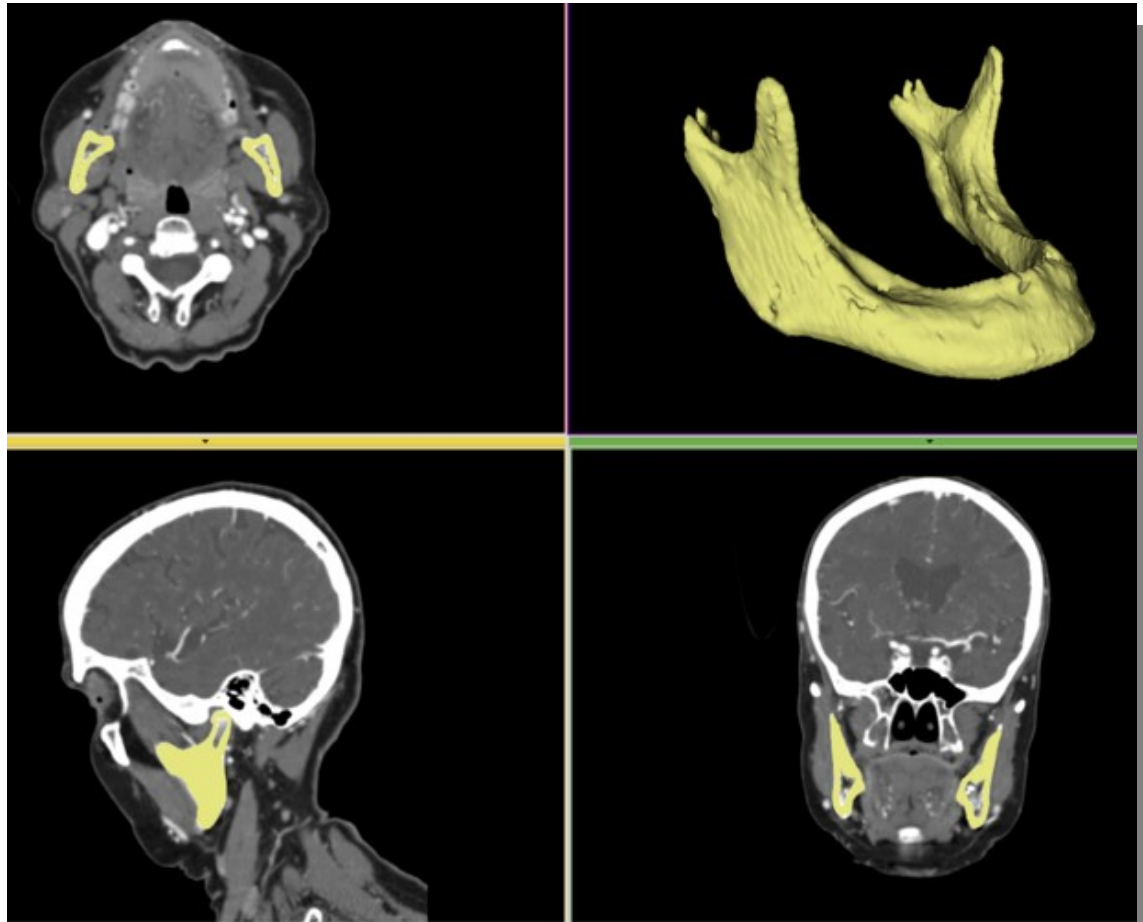
- CT <http://pubimage.hcuge.ch:8080/> MANIX data set
- Label: 1 axial slice





# More example, mandible

- Parameters:
  - Vol: 100ml
  - IH: 0.5
  - BS: 0.0
- 160 sec

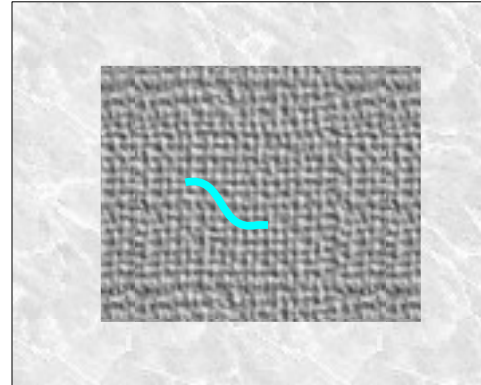




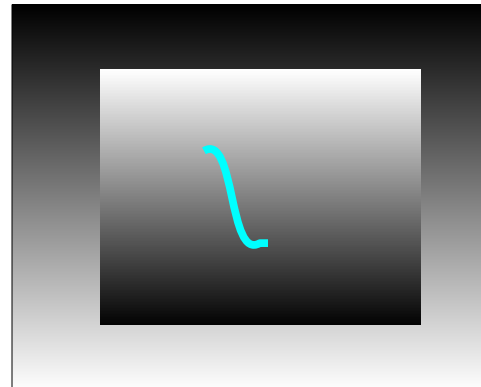
# What's not for

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- Texture images



- Intensity range similar to background





# Conclusion

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- A new module, RSS, in Slicer3.6
- It's basic usage
- How to tune it
- Cases RSS won't work



# Acknowledgments

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- Thank the creator of this template file, who makes tutorial preparation much easier.