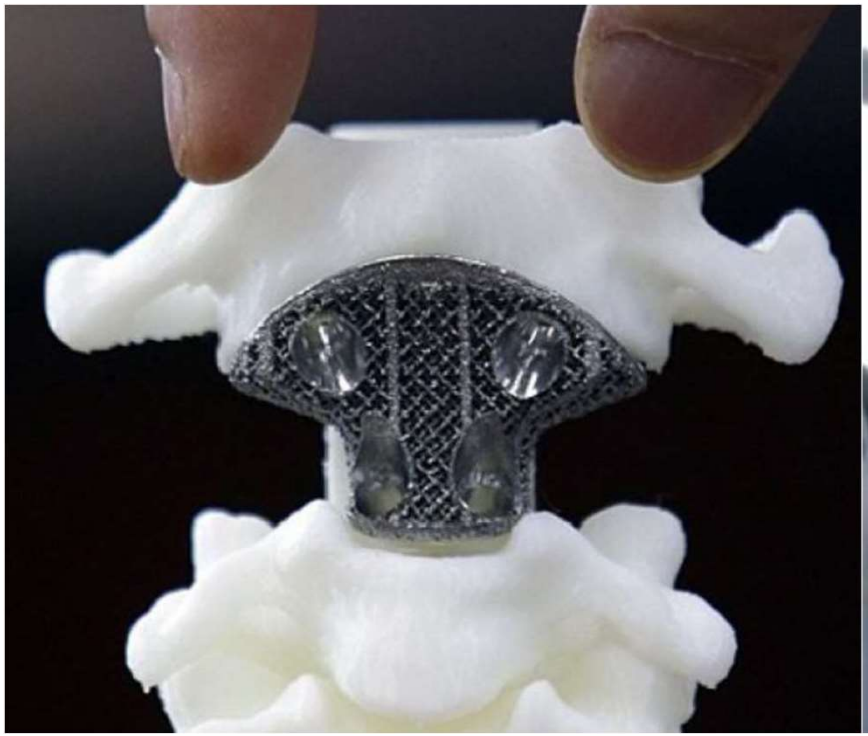
INCREDIBLE HEALTH · **Published** August 28, 2014 · **Last Update** October 26, 2015

First-ever 3D-printed vertebra implanted in 12-year-old cancer patient's spine



Qin Minglin, 12, was diagnosed with Ewing's sarcoma after he suffered a neck injury while heading a ball in sports practice. Doctors implanted a 3D-printed device in his spine after removing a tumor from between his first and third vertebrae. REUTERS

https://www.foxnews.com/health/first-ever-3d-printed-vertebra-implanted-in-12-year-old-cancer-patients-spine

Modified

from https://slicer.readthedocs.io/en/latest/

Overview

1. Load CT image
2. Segment vertebrae to be 3D printed
3. Save segment to STL file for 3D printing

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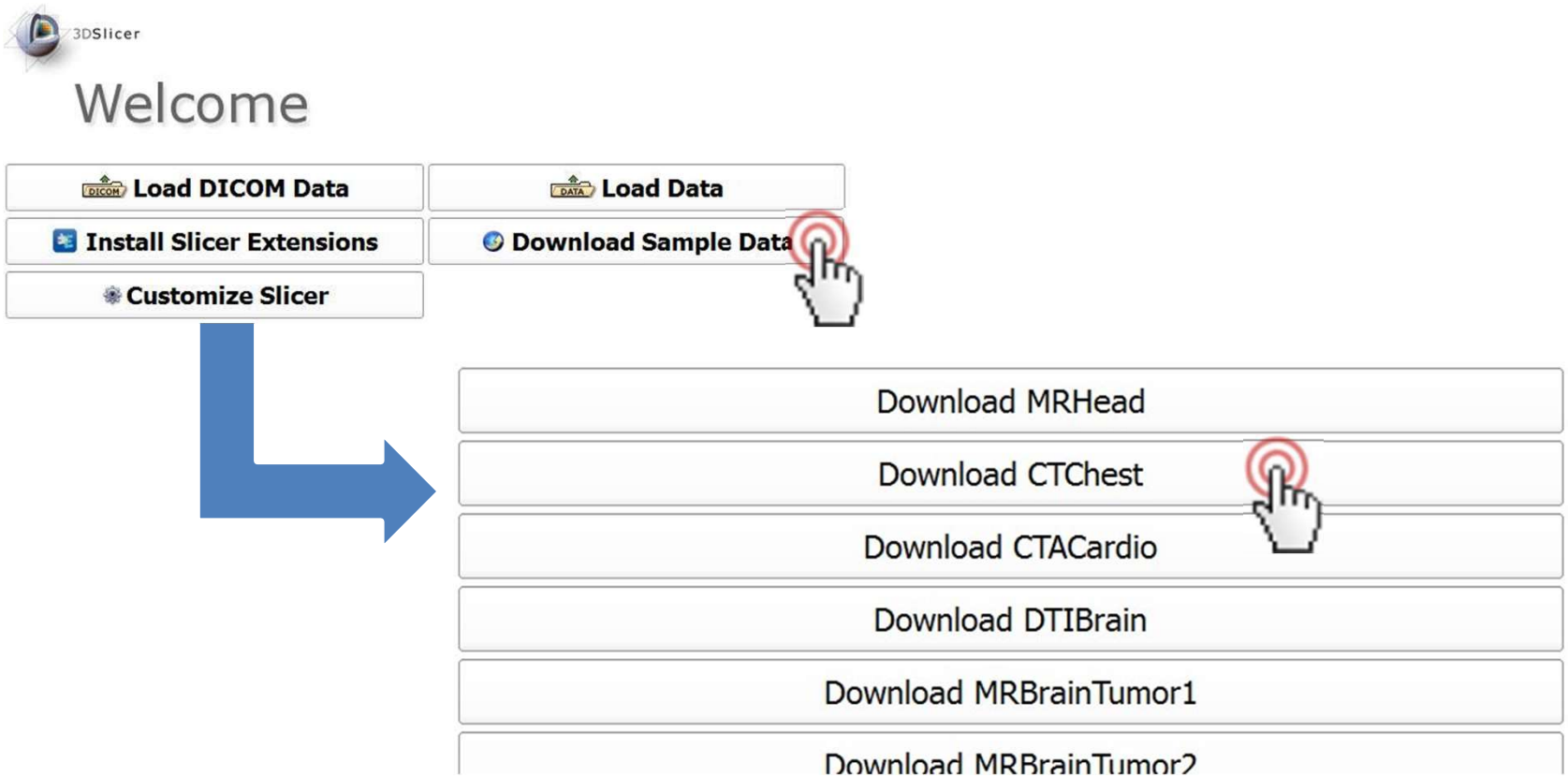
1/1: Load CTChest dataset



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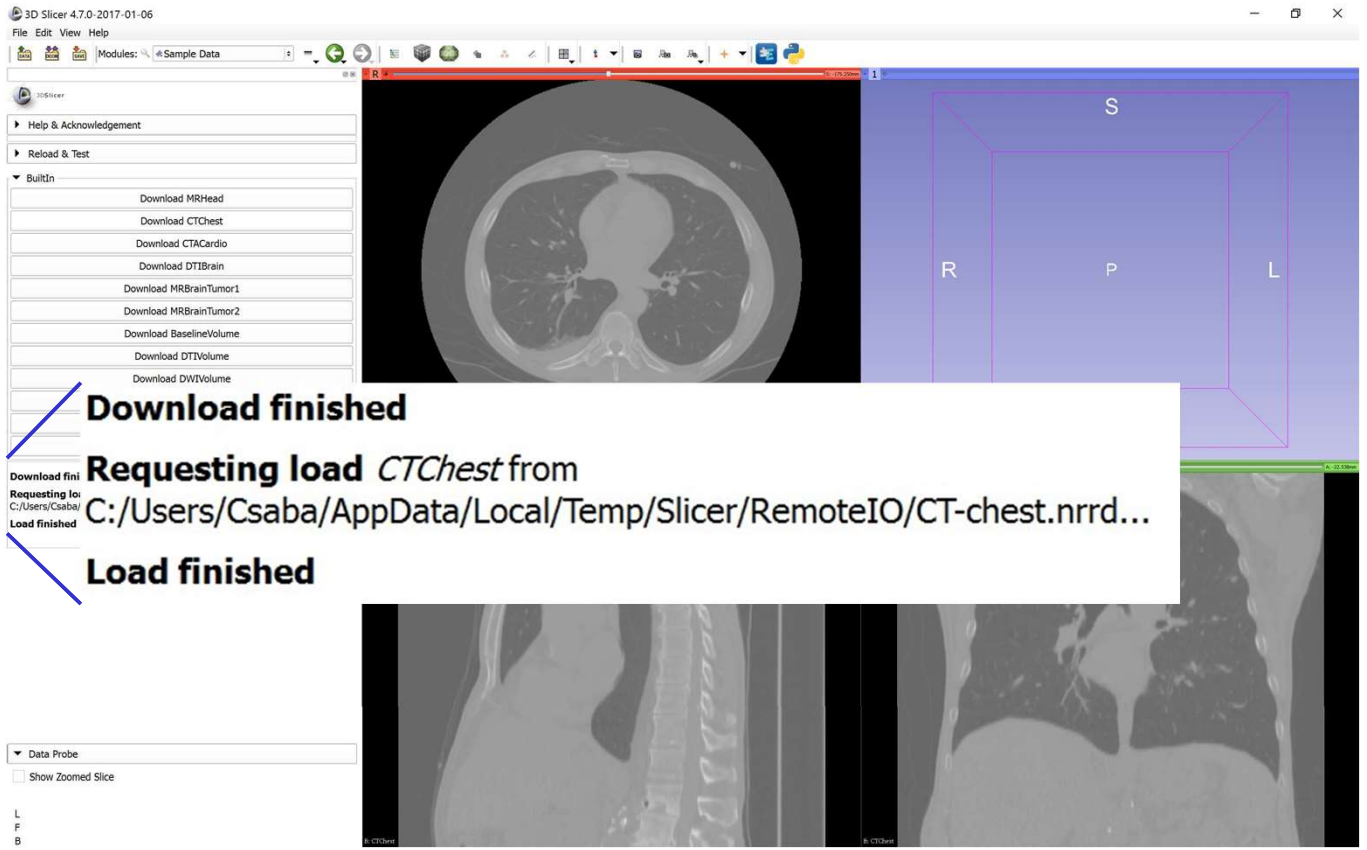
1/2: Sample CT loaded



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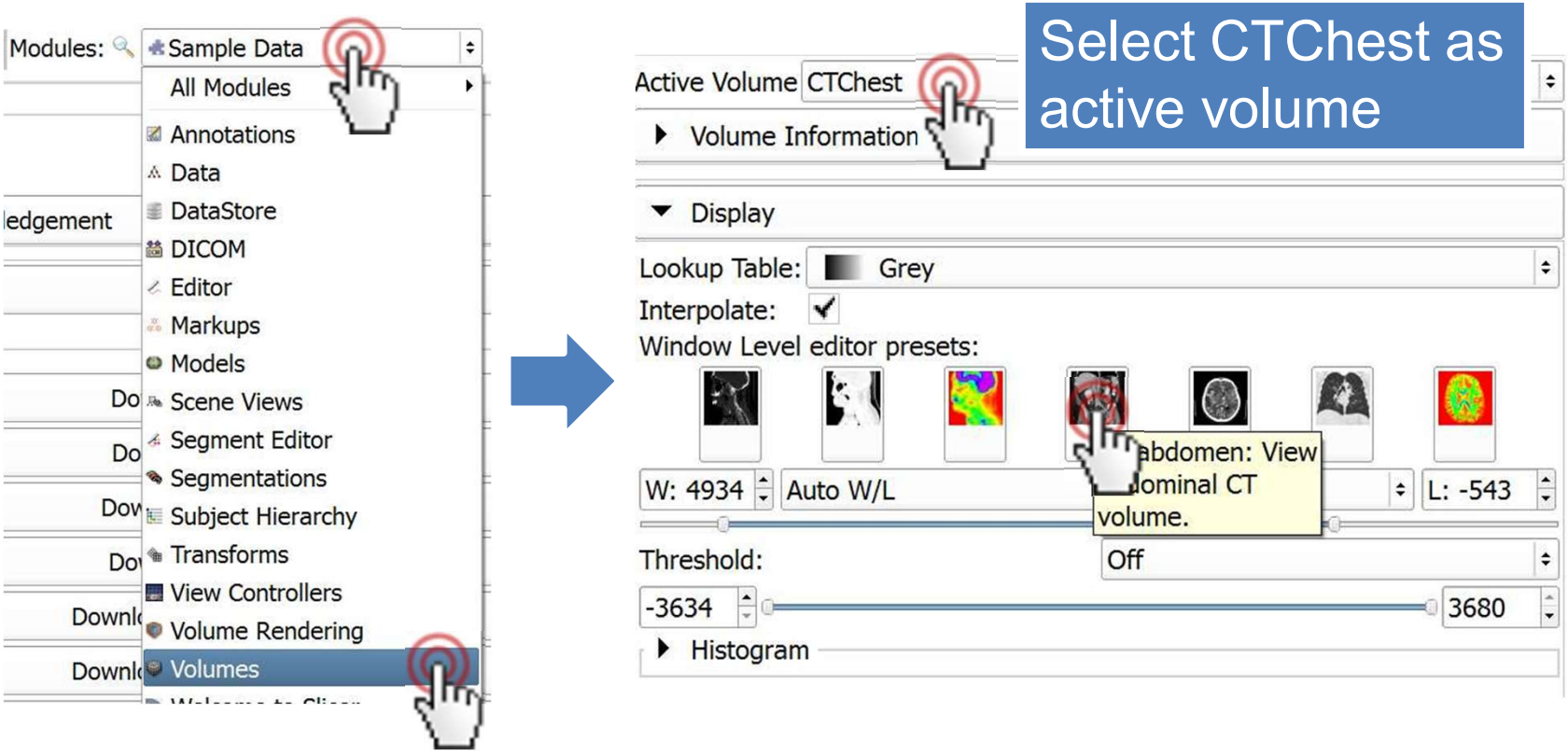
1/3: Change contrast



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Part 2: Segment vertebrae

Overview:

- Add new segment
- Threshold bone
- Remove speckles with Islands
- Cut out vertebrae with Scissors

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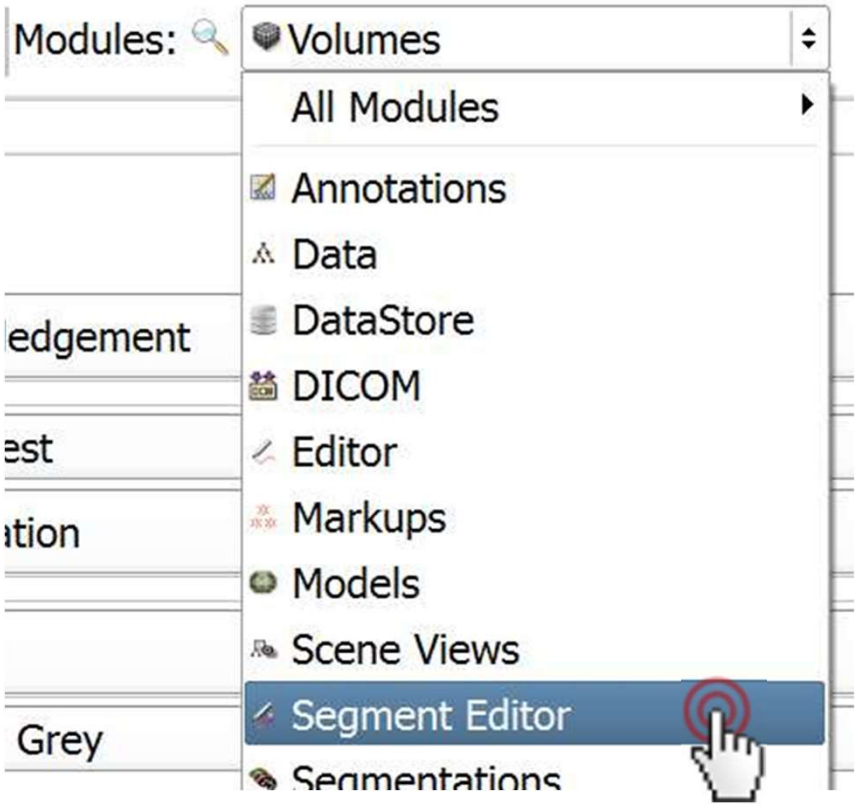
2/1: Switch to Segment Editor module



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2/2: Add new segment

-Segmentation automatically created
-CT volume automatically selected as master

(Master is the segmented volume that defines the resolution of the segments)

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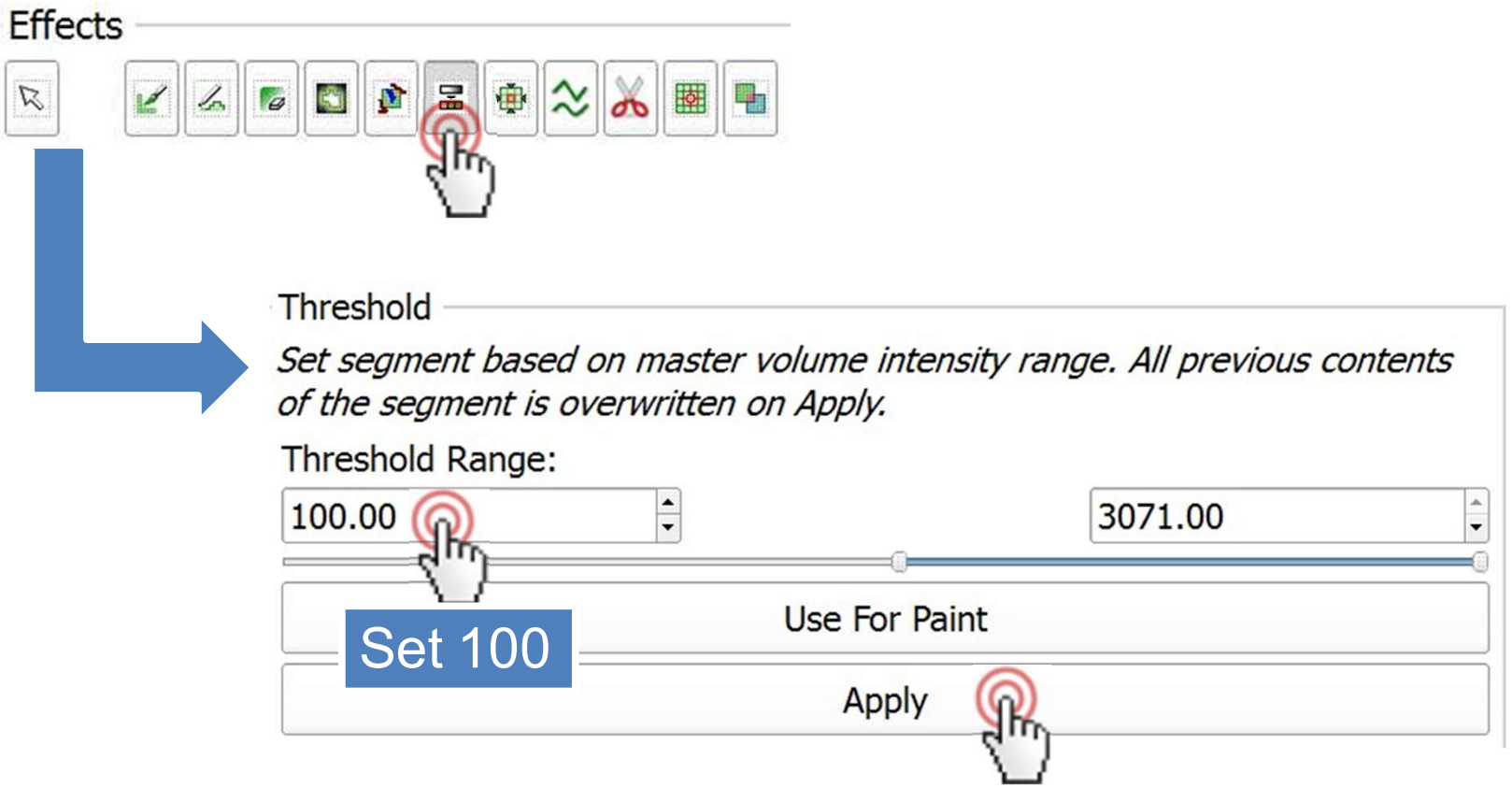
2/3: Threshold to get bone



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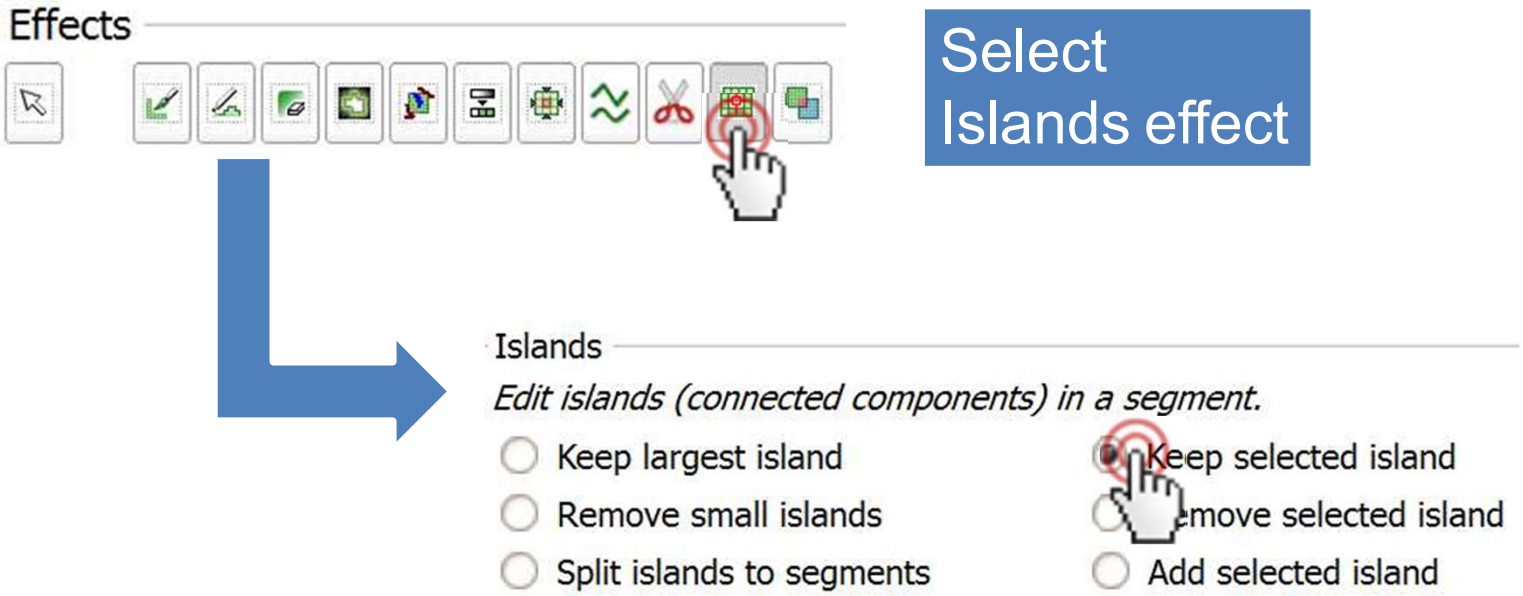
2/4: Remove speckle with the Islands effect



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2/5: Remove speckle with the Islands effect

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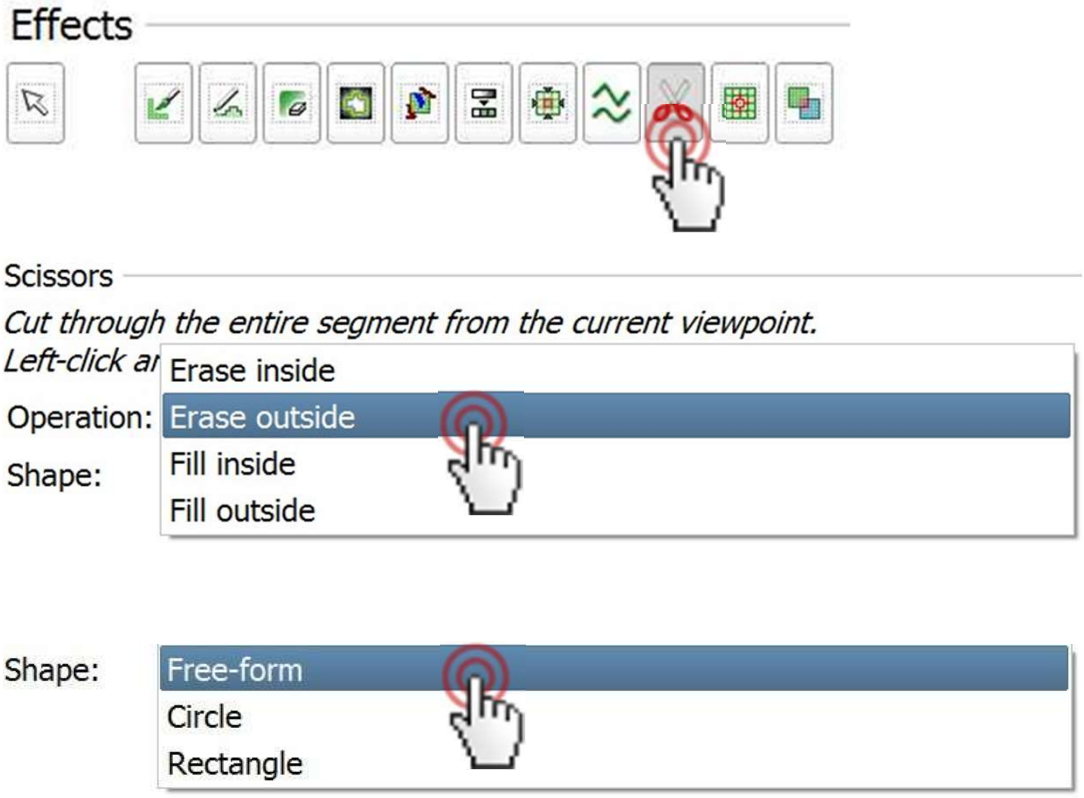
2/6: Cut out vertebrae with the Scissors effect



1.Select Scissors effect
2.Choose ‘Erase outside’ as operation
3.Choose ‘Free-form’ shape

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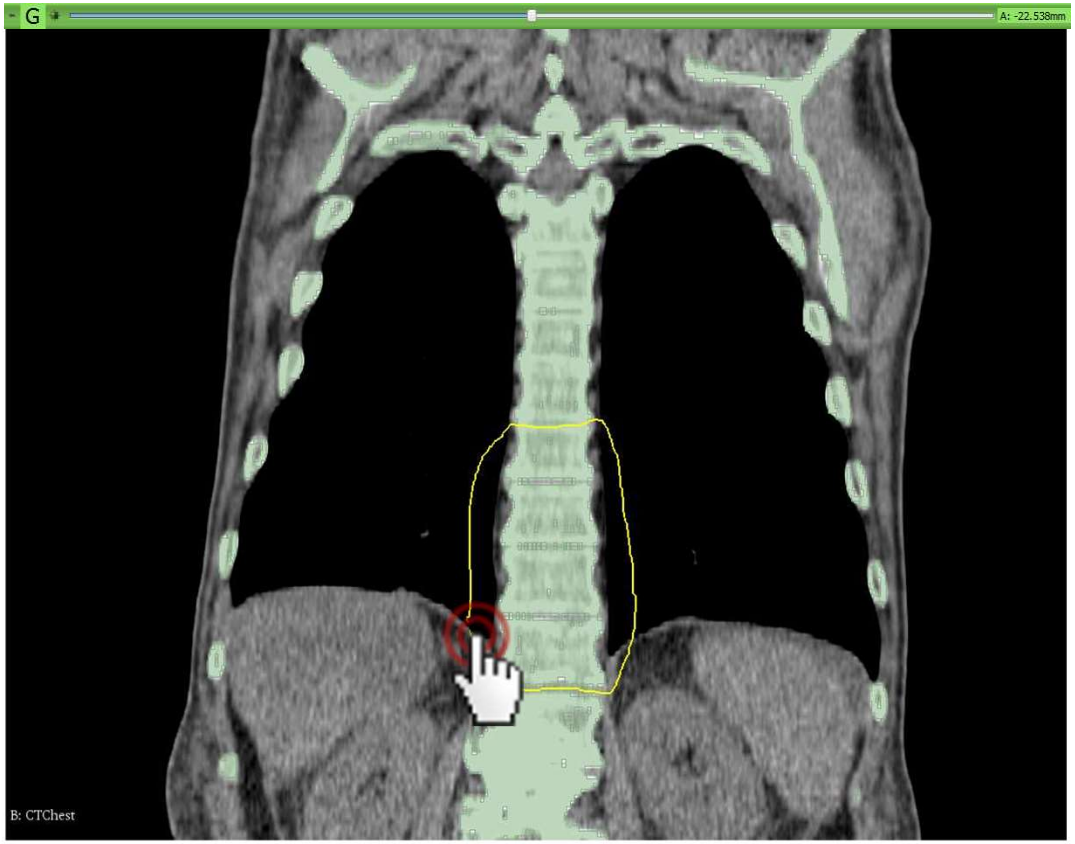
2/7: Cut out vertebrae with the Scissors effect



Trace around the desired vertebrae with the scissor on the coronal view (green slice)

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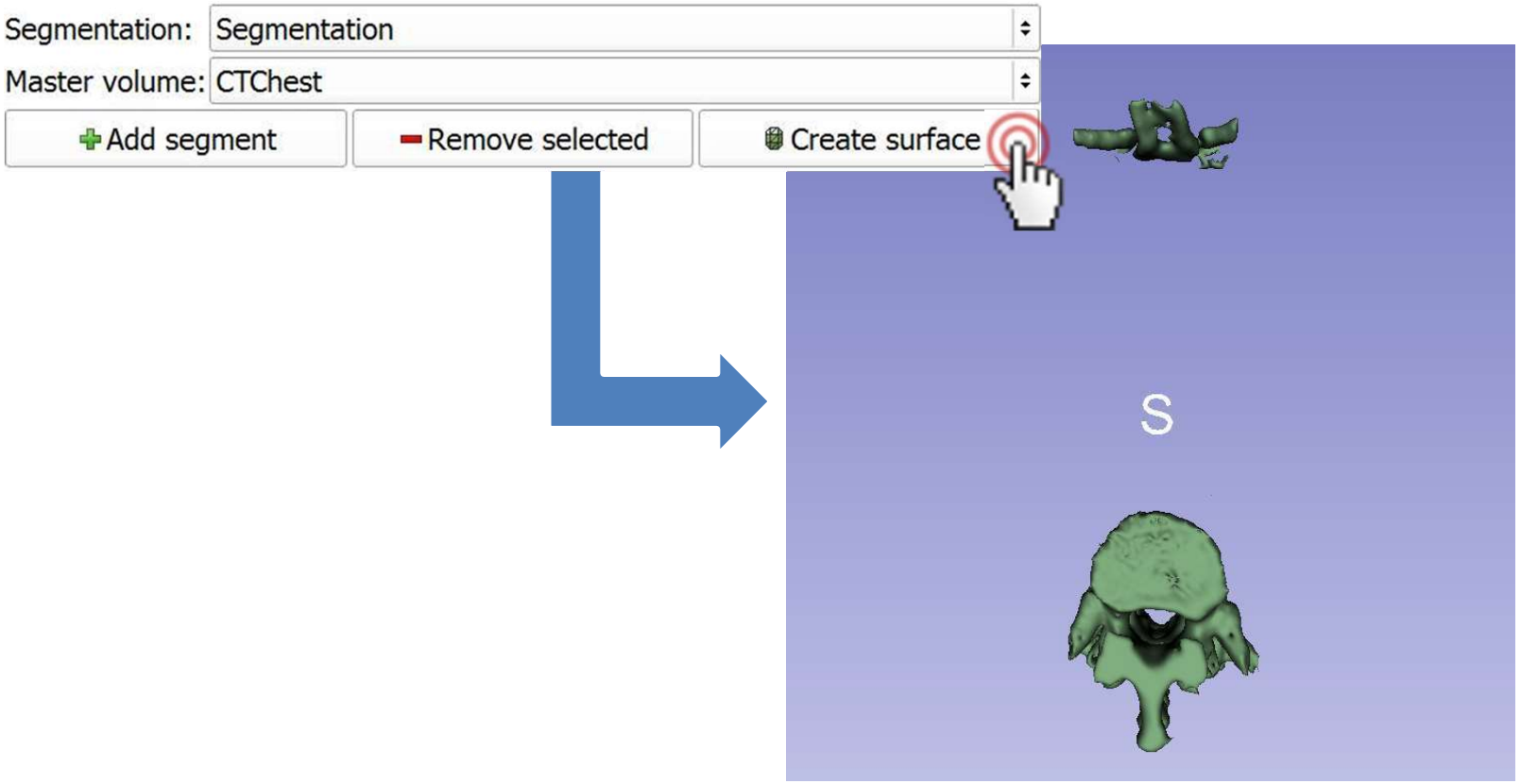
2/8: Show segment as surface in 3D view



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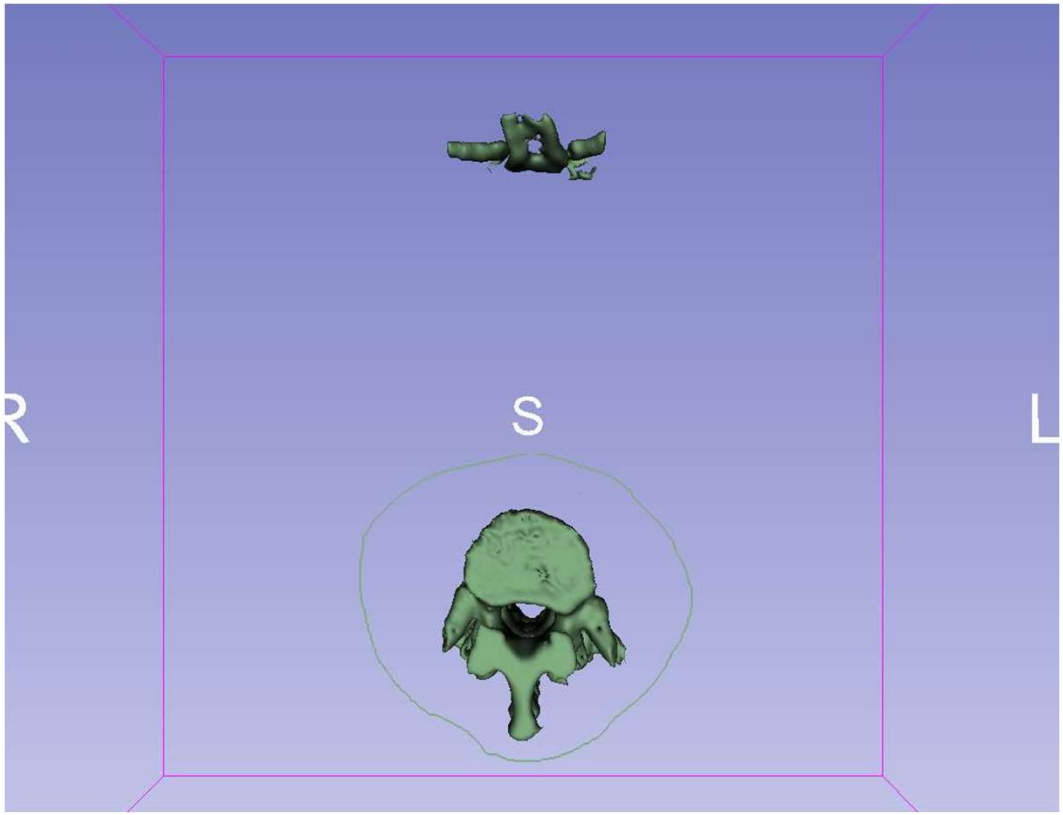
2/9: Remove remaining parts with Scissors



Select the vertebrae in the 3D view to erase the remaining parts (ribs on the anterior side in this case)

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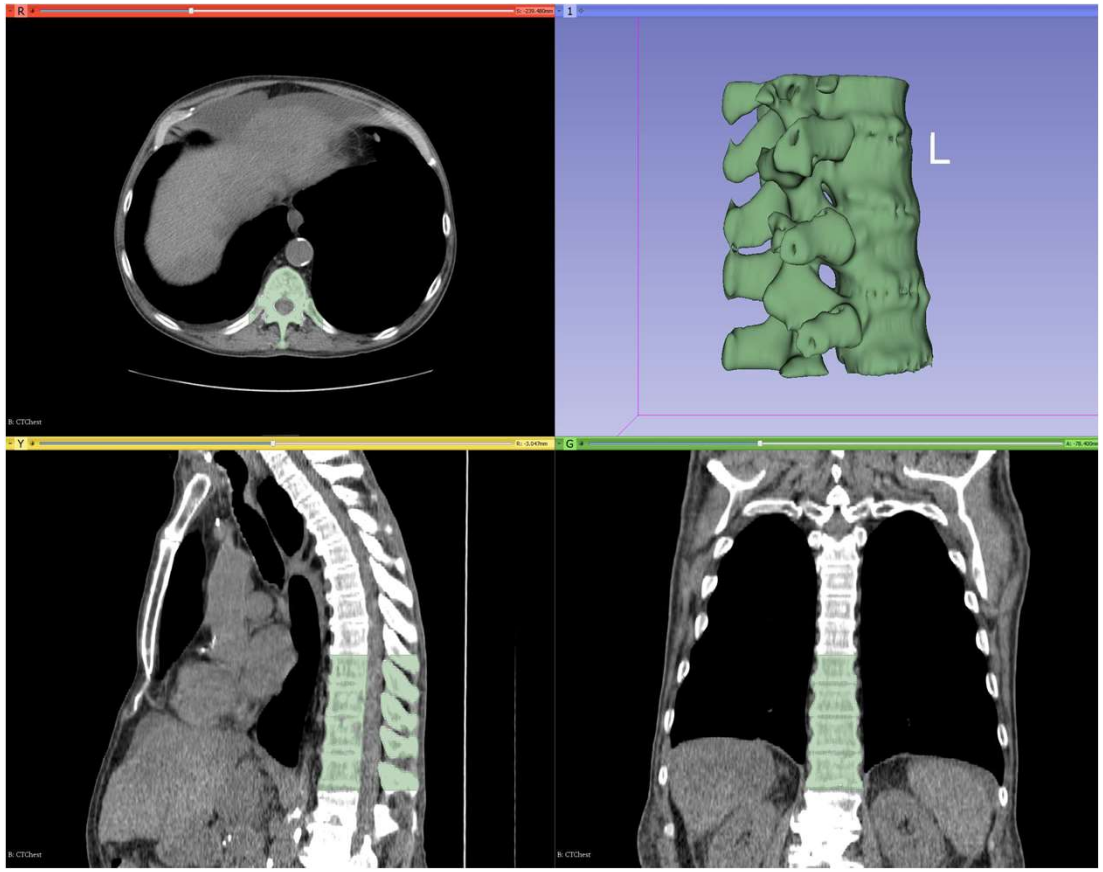
2/10: Vertebrae are segmented



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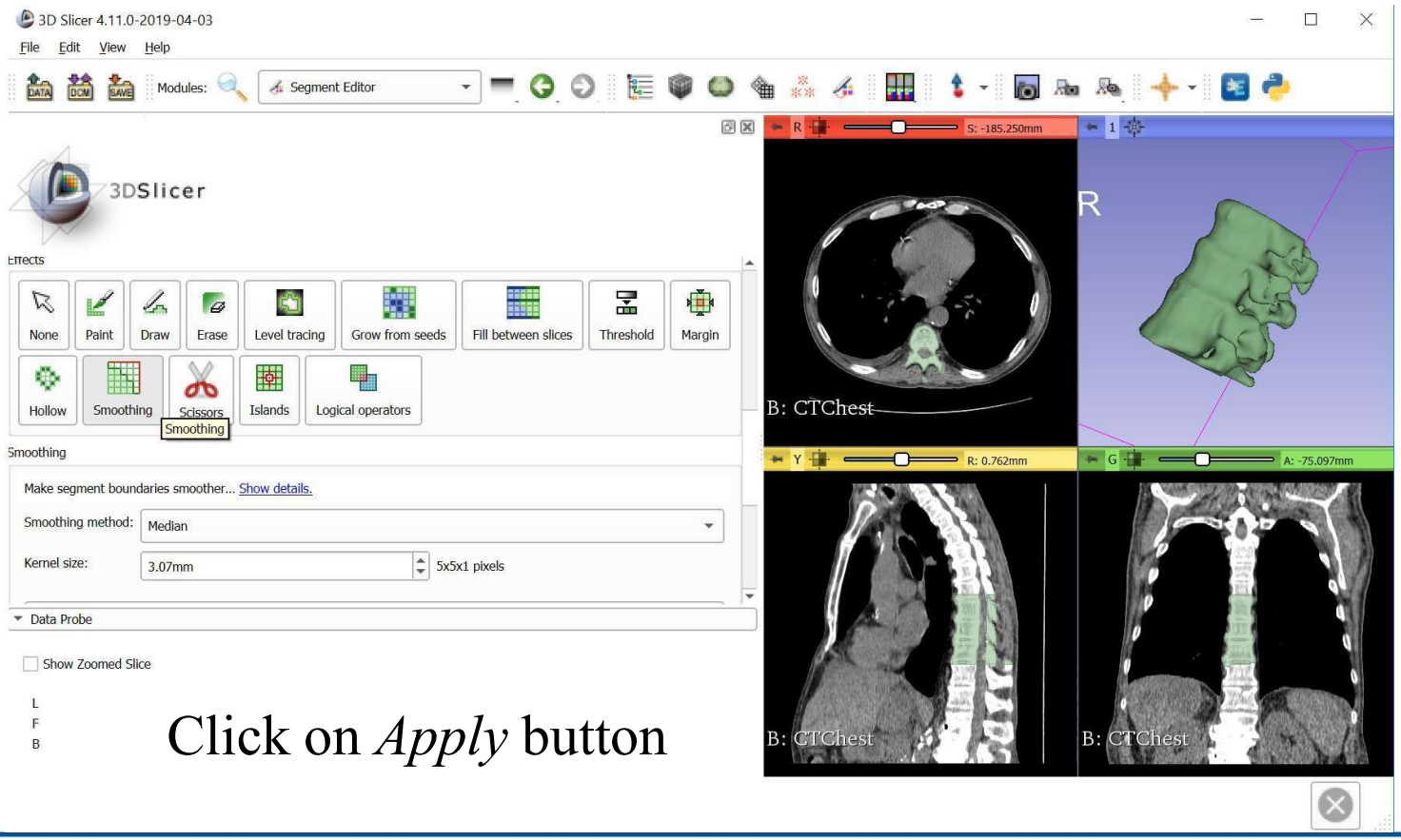
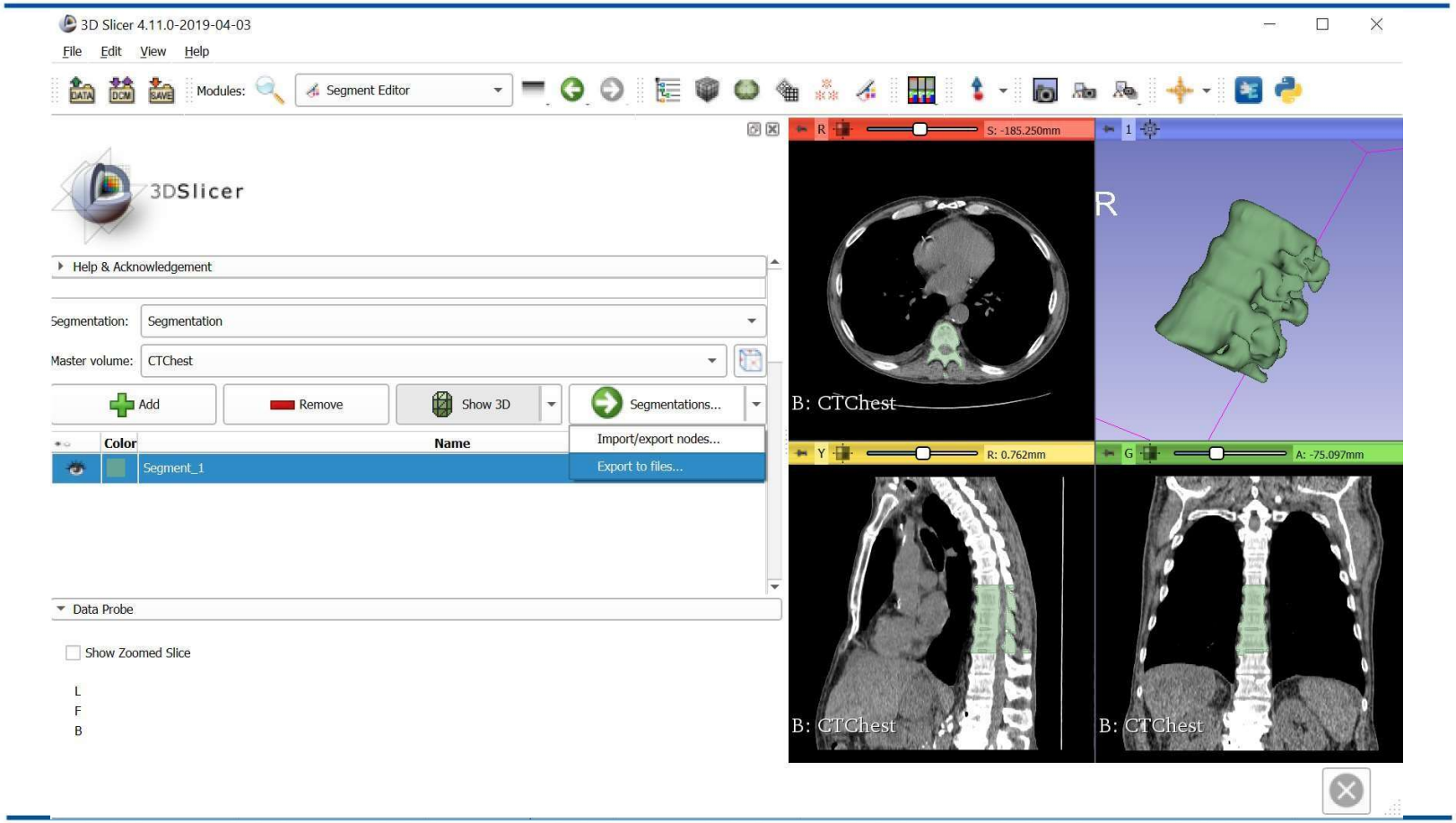
2/11: Vertebrae are smoothed

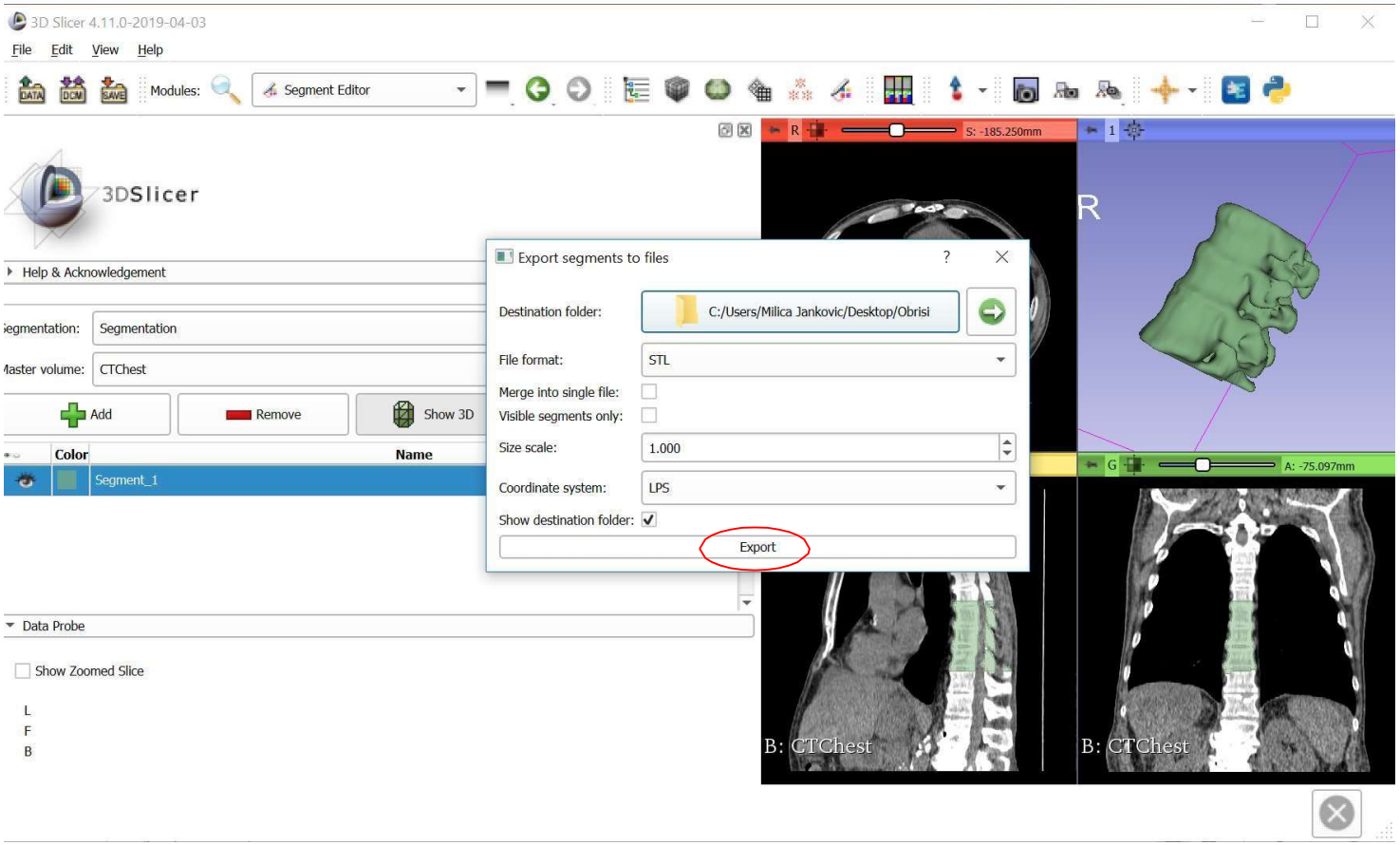


Click on *Apply* button

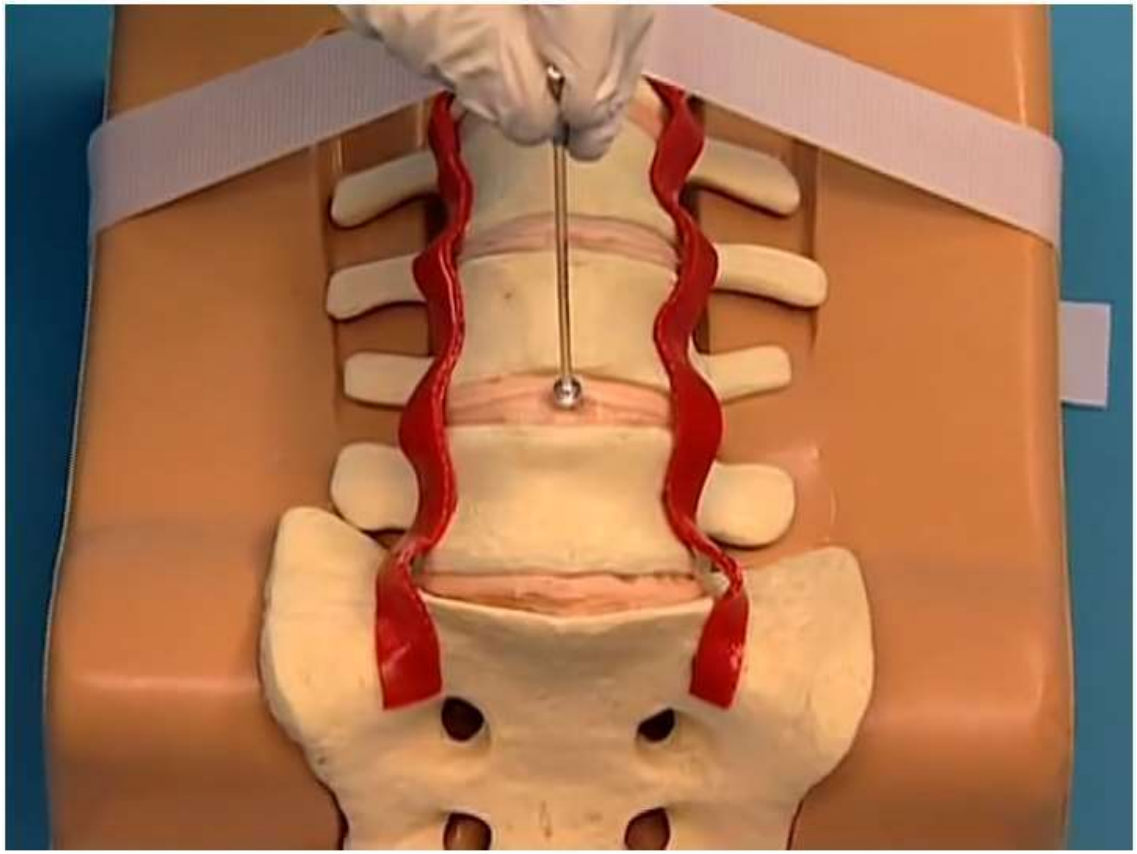
Part 3: Save to STL



Part 3: Save to STL



Synthes Spine ProDisc-L Lumbar Total Disc Replacement



https://www.youtube.com/watch?v=WH5phRh89Go&feature=youtu.be