

Bone Segmentation and Surface Extraction Webinar - Questions and Answers. September 29th, 2011.

Q. What surface File formats are supported by Analyze?

A. Analyze supports the following surface files.

Polygonal Formats

Alias Wavefront	.obj	Read and Write
Autocad	.dxf	Read and Write
IGES	.iges	Write only
Compressed IGES	.iges	Write only
Inventor	.iv	Write only
Patran	.out	Write only
Poly	.poly	Read and Write
Binary 3D Systems	.stl	Read and Write
VRML	.wrl	Write only

Contour Formats

HP 3D (.hpgl) Write only	.hpgl	Write only
IGES	.iges	Write only
Compressed IGES	.iges	Write only
Pogo	.slc	Read and Write
3D Systems Stereolithography	.slc	Read and Write
ASCII Columns	.txt	Read and Write

Q. Does the Surface Extraction module contain any surface re-meshing tools?

A. No, the Surface Extraction module does not contain any re-meshing tools. However, the parameters within the adapt/deform algorithm provide some utility to optimize your surface by allowing you to adjust the number of iterations, cube edge size, time step, surface force, and spring constant.

Q: If I already have a surface file in one format and wish to convert to another surface file format can I do this with the Surface Extractor module?

A: Yes, the File > Convert Surface > To Surface utility will allow you to do this. However, only those surfaces with 'Read' support (see the table above) can be used as an input to the surface-to-surface function.

Q. Can I convert a surface to a volume?

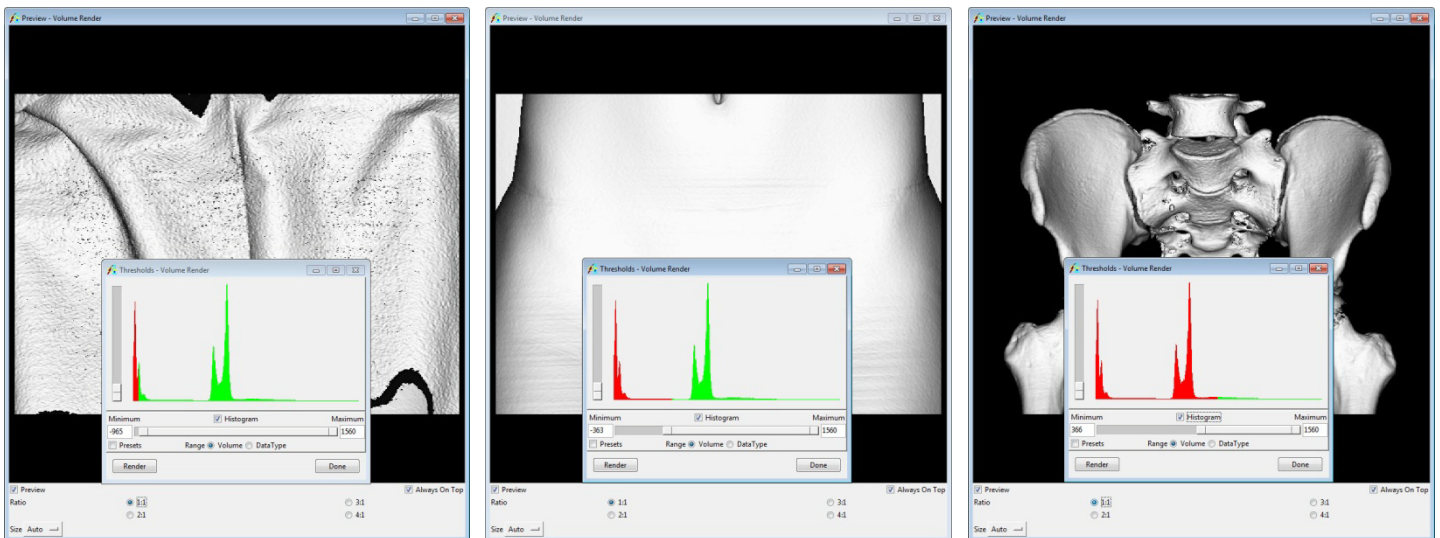
A. Yes, the process, also known as 'voxalization', is facilitated via the File > Convert Surface > To Volume utility. The resulting volume is a binary voxel representation of the input surface. Additional processing maybe necessary to fill holes or the volume, which can be achieved via the morphological tools provided in Analyze. If the corresponding grayscale image data is also available it is possible to multiply the binary image data with the grayscale image data via the Image Calculator or Image Algebra modules to derive a grayscale representation of the 'voxalized' surface, of course the surface and image data would need to be in registered first.

Q. There is a Right-Handed check box option on the Save Surfaces window – what is this for?

A. When set, the model will be transformed from the left-handed coordinate system used by Analyze into the right-handed coordinate system used by the majority of geometric file formats. This option will default to the correct setting for the file format selected.

Q: Was the initial CT image set segmented prior to loading it into Volume Render?

A: No, the CT data set was segmented in the Volume Render module using a combination of Thresholding (see below) and Object Separation.

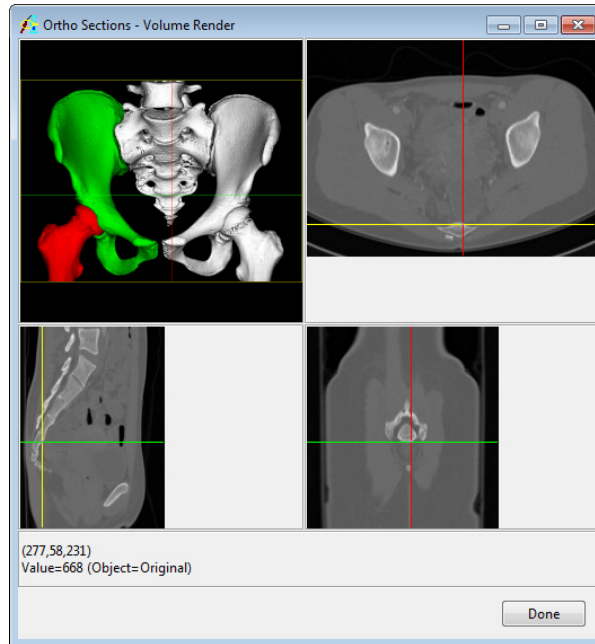


As the threshold minimum is increased in the threshold tool, voxels with a Hounsfield Unit lower than the minimum are interactively masked from view. This allows users to quickly remove all non-bone voxels from the current view.

For more information please review the following Volume Render exercise: [Volume Render Advanced](#)

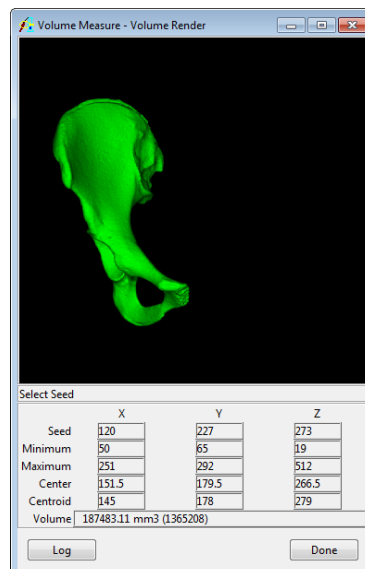
Q: Can I get a mid-coronal view of a volume from transverse CT sections?

A: Yes, you can actually get this on the fly in Volume Render using the Ortho Sections Tool available from Tools > Display.



Q: Can you derive bone volumes from these segmentations within Analyze?

A: Yes, this can actually be achieved from within the Volume Render module. Use the Volume Measure Tool available from the Tools > Measure menu. Click on the object you wish to measure and the tool will calculate and return the volume of the selected object for you. Note the algorithm connects out to every voxel it can spatially connected to, so use the Objects window (View > Objects) to switch off any object you do not wish to sample.



Q: We are currently using Analyze 6.0. What are the major improvements in Analyze 10.0, besides the edge enhancement, to help with volume and surface extraction?

A: A full list of new features and enhancements made with every release of Analyze, including Analyze 10.0 is available on our website at: <http://analyzedirect.com/Analyze/enhancements.asp>

Q: How do you define the boundary on the bone of the femur? What properties do you use?

A: In the Webinar I used the Volume Edit Edge Strength option to enhance the edge of the bone. The Edge Strength option performs a Sobel Filter transformation on the input data set and then adds the result to the input data; this provides enhanced edges within the grayscale data.

Q: What is the best strategy for separating degenerated joints?

A: This depends on the image data. If you would like to connect for a one-to-one session please feel free to e-mail me (michael@analyzedirect.com) to set this up.

Q: With CT scan data how do you draw boundaries around features you want to extract?

A: There are several tools in Analyze to allow you to do this. Please refer to the following module specific exercises for more information on how to apply these tools to your CT data.

[Volume Render - Advanced](#)

[Image Edit - Manual Segmentation of Grayscale](#)

[Image Edit - Manual Segmentation and Object Map Creation](#)

[Region of Interest - Defining Regions and Volume Measurement](#)

If you have additional questions or comments please contact me:

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