Basics of Data Loading and 3D Visualization in 3D Slicer

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Overall Goal

Ce tutoriel est une introduction aux notions de base du chargement et de l’affichage des images DICOM et des modèles 3D dans 3D Slicer.

Learning Objectives

- Following this tutorial, you will be able
- to load and visualize DICOM images in Slicer
- to perform volume rendering of CT data
- to load and visualize 3D models reconstructed from MRI data

Matériels du tutoriel

- 3D Slicer version 5.10
- 3D VisualizationDataSet.zip

Jeu de données du tutoriel

The file 3DVisualizationDataset.zip contains two directories:

- dataset1_Thorax_Abdomen

- dataset2_Head

Unzip the file 3DVisualizationDataset.zip on your computer to access the datasets

Avertissement

• 3D Slicer is a free open source software application distributed under a BSD style license.

• The software is not FDA approved or CE-Marked, and is for research use only.

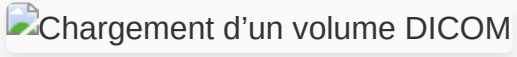
Tutorial Outline

Plan du tutoriel

- Part 1: Loading and Viewing DICOM data
- Part 2: Volume Rendering
- Part 3: Loading and Viewing 3D models

Part 1: DICOM Data Loading

Chargement d’un volume DICOM



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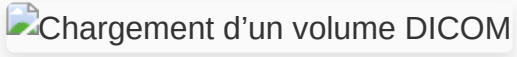
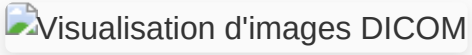


Visualisation d'images DICOM



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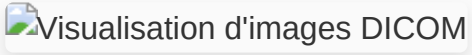

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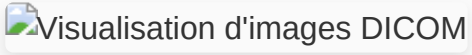

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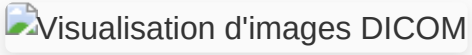

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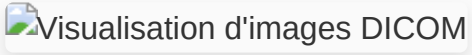

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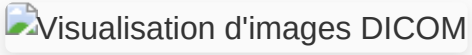

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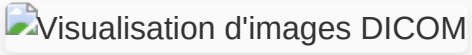

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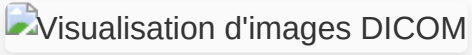

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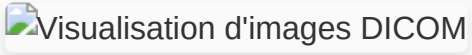

Contrôleur de la Visionneuse 3D

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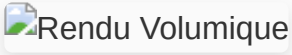
Part 2: Volume Rendering

Rendu Volumique

• Volume rendering techniques enable 3D visualization of 3D datasets

• The Volume Rendering module in Slicer enables interactive 3D visualization of DICOM images

Rendu Volumique



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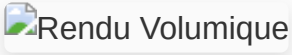

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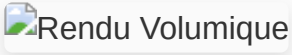

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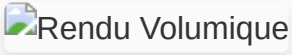

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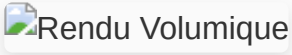

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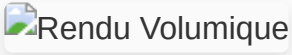

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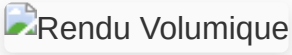

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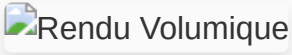

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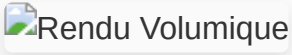


Part 3: Loading and viewing 3D models

Cliquez sur File

- The directory dataset2_Head contains the Slicer scene called Head_scene.mrb
- The scene contains 3D models from the SPL brain atlas developed by the department of Radiology at Brigham and Women’s Hospital, Harvard Medical School (NIH P41 RR013218, NIH R01 MH05074)

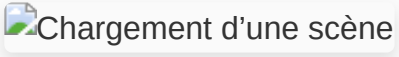
Scène Slicer

Slicer stores all loaded data in a repository called a scene

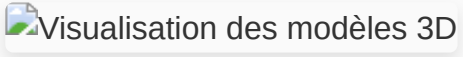
Each data set, such as an image volume, surface model, or point set, is represented as a node in a Slicer scene.

All Slicer modules operate on the data stored in a Slicer scene.

Chargement d’une scène



Visualisation des modèles 3D



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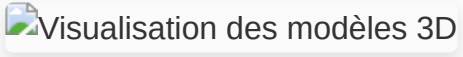

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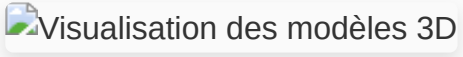

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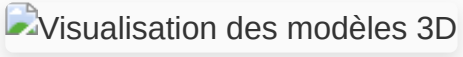

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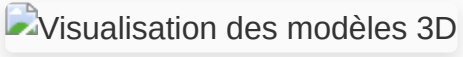
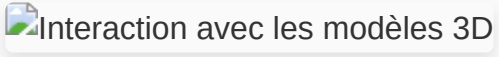


Interaction avec les modèles 3D



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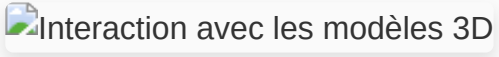

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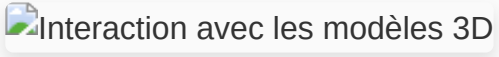

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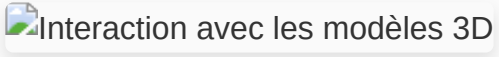

Conclusion

- 3D Slicer provides advanced functionalities for loading and viewing 3D medical imaging data
- The tutorial demonstrates how to use volume rendering and 3D surface modeling for interactive visualization of CT and MRI data

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Remerciements

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