Week 1: How to load and display a 3D medical image

Materials

MDSC 689.03 - W2017 Students > Image_Datasets

- Hip.zip → MRI image of the hip. DICOM format.
- Thorax.tar.gz → CT image of the thorax. DICOM format.
- head.nii.tar.gz → MRI image of the head. NIfTI format.

*tar.gz files can be uncompressed in linux using ***tar -xvzf *.tar.gz***
*The WinRAR program can also help to uncompress images in Windows and MacOS.

Assignment

- Load images in DICOM format.
- Load images in NIfTI format.
- Display slices of the loaded images.
- **Due on: Next monday at noon. Python files and screen captures must be uploaded to your Dropbox directory.**

Important considerations

- Remember the elements required to display any object in VTK: Reader, mapper, actor, renderer, window, and interactor.
  vtkDICOMImageReader, vtkImageMapper, vtkActor2D, vtkRenderer, vtkRenderWindow, and vtkRenderWindowInteractor.
- In order to read DICOM and NiftI images, consider the following readers:
  vtkDICOMImageReader and vtkNIFTIImageReader.
- Note the difference between the methods: SetDirectoryName(directory) and SetFileName(file), in each reader.
- Do not forget to set suitable values for the slice you want to display, and the window and level.
  mapperDicom.SetZSlice(int(zSlice))
  mapperDicom.SetColorWindow(1000)
  mapperDicom.SetColorLevel(0)

Extra material

How to navigate through different slices using observers and events.

interactor.AddObserver("KeyPressEvent", UserDefinedFunction, 1.0)

Some results

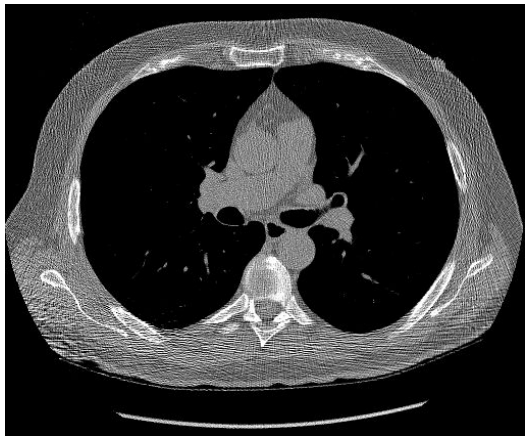

Figure 1. Slice number 100 of the Thorax.tar.gz dataset. Window: 1000, level: 0.

Figure 2. Slice number 100 of the head.nii.tar.gz dataset. Window: 1000, level: 500.