First Training Program and Workshop

MACbioIDi – February – March 2018

Medical Technology. Definitions.

Medical Imaging

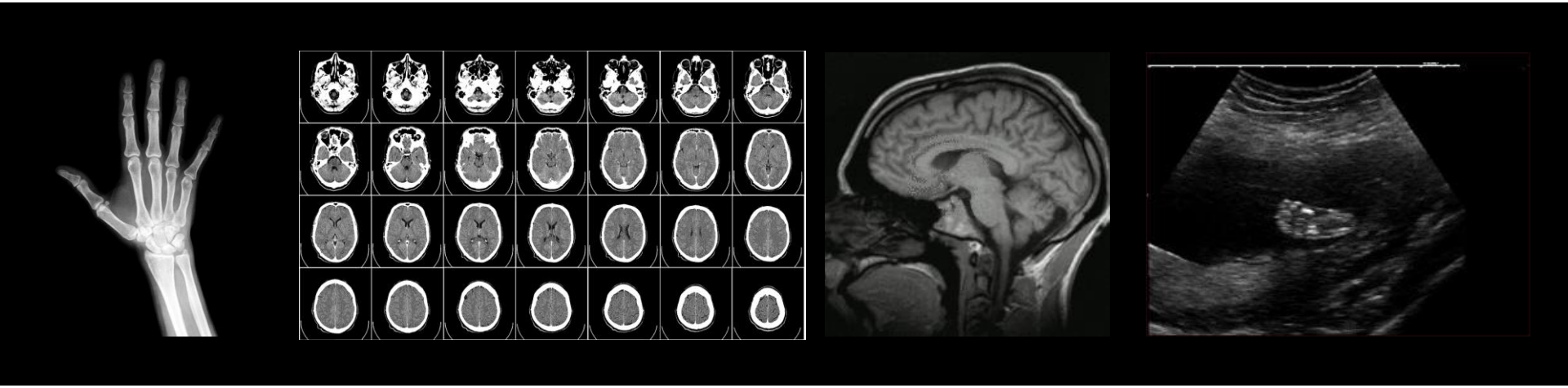
Types of images

3D Slicer

- Hardware configuration
- Technical elements

Medical Technology.

Medical imaging is the process of creating visual representations of the interior of a body.

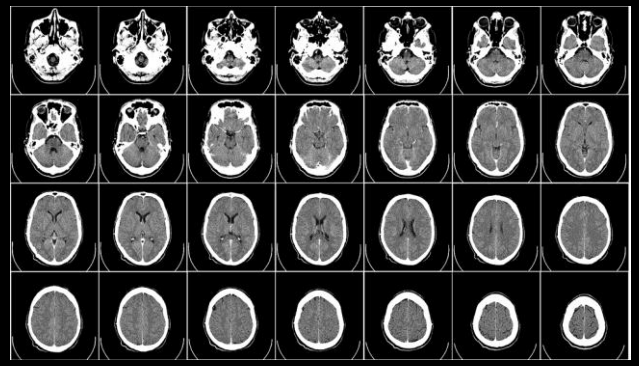


Medical Technology.

X-ray a form of electromagnetic radiation, invisible to the human eye, capable of traversing opaque bodies and printing photographic films.

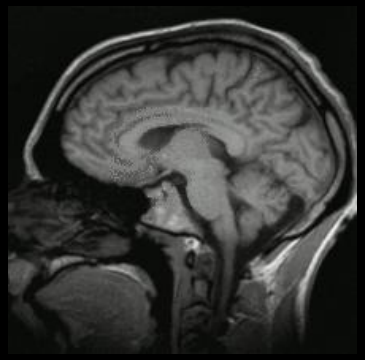
Medical Technology.

CT makes use of computer-processed combinations of many X-ray measurements taken from different angles to produce cross-sectional images (virtual slices)



Medical Technology.

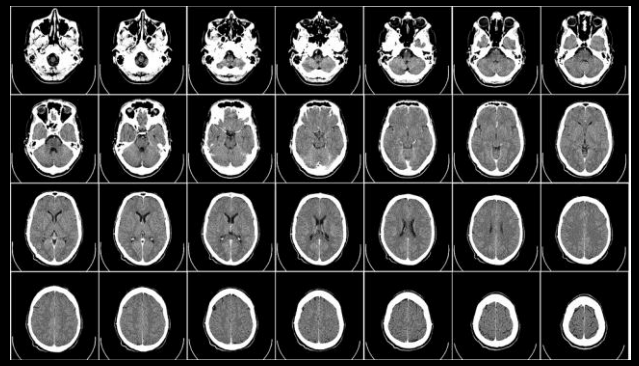
Magnetic Resonance are images of the organs in the body created through MRI scanners that use strong magnetic fields, electric field gradients and radio waves.

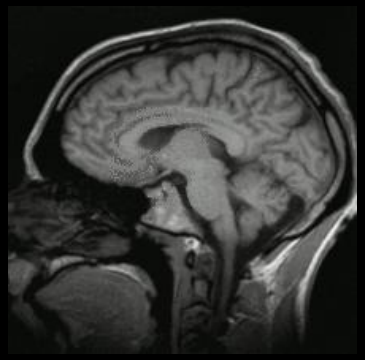


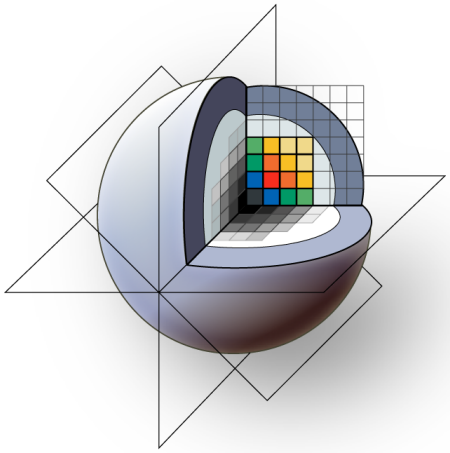
Medical Technology.

UltraSound is a diagnostic imaging technique that applies ultrasound, to get an image to see internal body structures and internal organs.

Medical Technology.

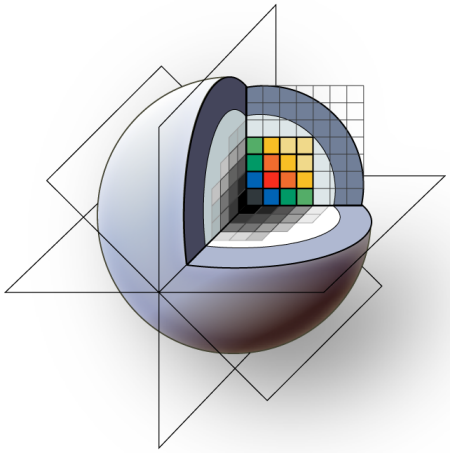






3DSlicer

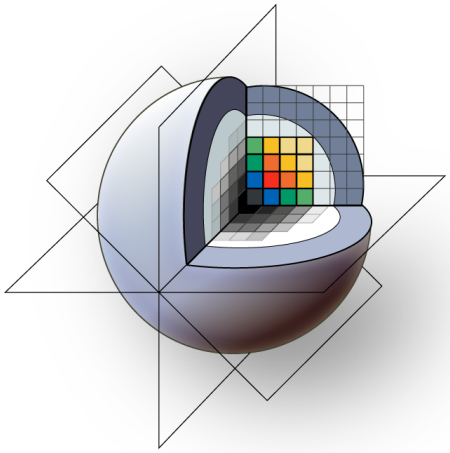
3D Slicer is an open source software platform for medical image informatics, image processing, and three-dimensional visualization.



3DSlicer

Hardware configuration

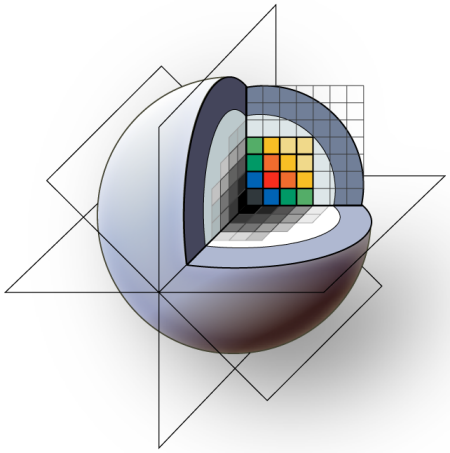
Memory
Display
Graphics hardware
Computation
Interface device



3DSlicer

Technical Ecosystem:

Programming laguages: C++, Python
Framework: Qt
Toolkits: Vtk, Itk
Ides: Qt Creator, Visual Studio, Eclipse, Pycharm
Standards: DICOM
Cross-platform tool: Cmake

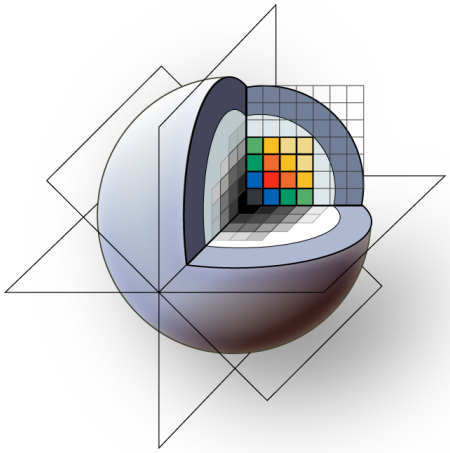


3DSlicer

Technical Ecosystem:

Programming laguages: C++

Is a general purpose programming language. Imperative, object-oriented.



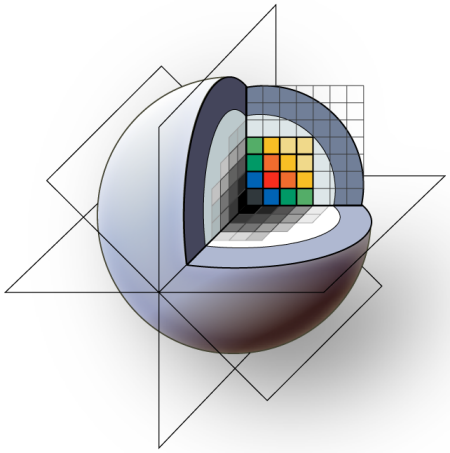
3DSlicer

Technical Ecosystem:

Programming laguages: Python

Is a general purpose programming language. Imperative, object-oriented, functional, procedural.

python™

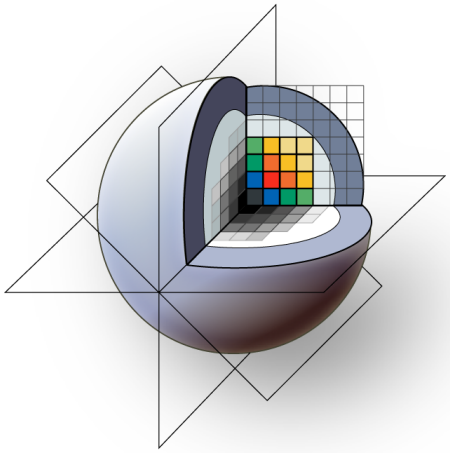


3DSlicer

Technical Ecosystem:

Framework: Qt

Is a cross-platform application framework to develop software that can be run on different software and hardware platforms with little or no changes.

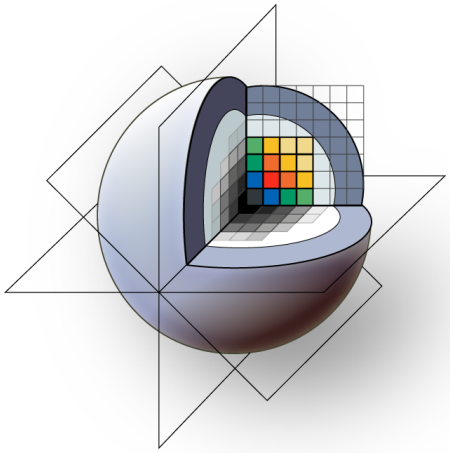


3DSlicer

Technical Ecosystem:

Toolkits: Vtk

VTK. Is an open source software system for 3D computer graphics, image processing and visualization.

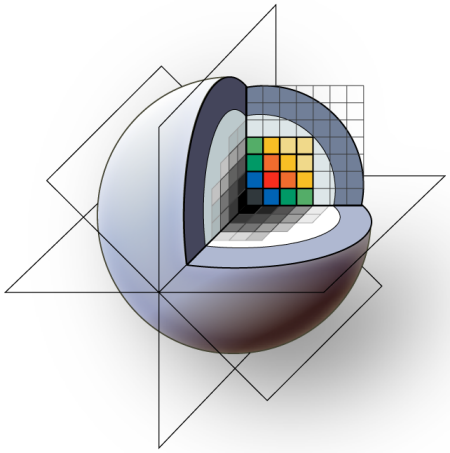


3DSlicer

Technical Ecosystem:

Toolkits: Itk

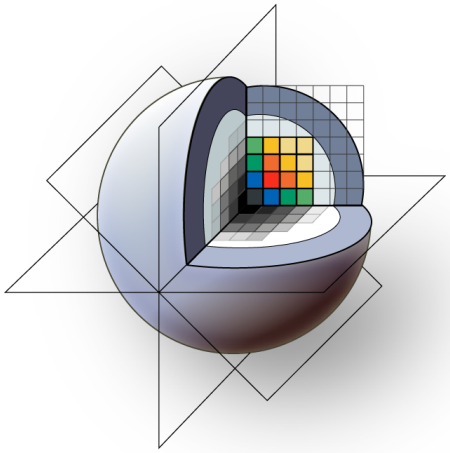
ITK. Is an open-source, cross-platform system that provides developers with an extensive suite of software tools for image analysis.



3DSlicer

Technical Ecosystem:

Ides: Qt Creator, Visual Studio, Eclipse, Pycharm

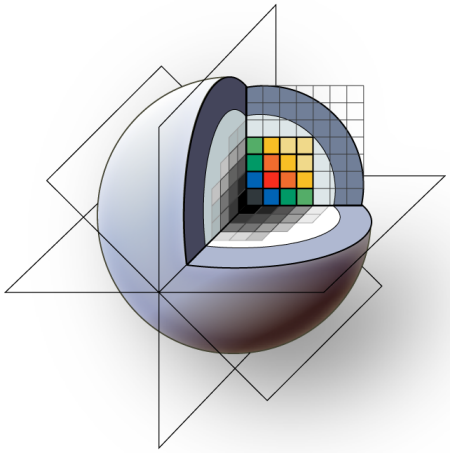


3DSlicer

Technical Ecosystem:

Standards: DICOM

DICOM (Digital Imaging and Communications in Medicine) is a standard for storing and transmitting medical images, enabling the integration of medical imaging devices



3DSlicer

Technical Ecosystem:

Cross-platform tool: Cmake

Is an open-source, cross-platform family of tools designed to build, test and package software.

CMake
Cross-platform Make

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