3D Slicer

Group 11
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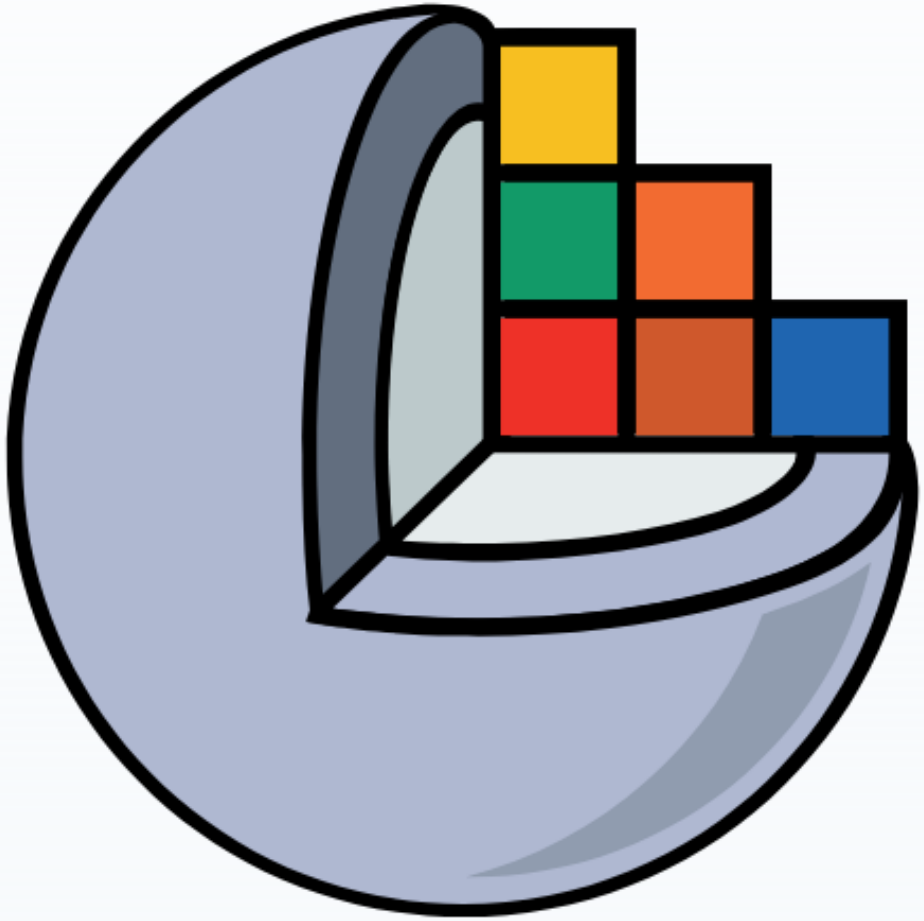
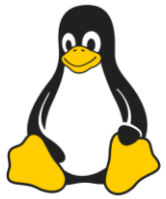


About the tool and its utilities

- 3D Slicer is a **free**, **open source** and **multi-platform** software package widely used for medical, biomedical, and related imaging research.
- Developed in C++ and Python
- It has 100+ built in modules for different use cases in medical imaging and research.
- It supports DICOM format which is the internationally accepted standard for medical data and image exchange.

System Requirements

- Supported Platforms


- Minimum RAM : 4 GB (8 GB Recommended)
- Discrete GPU is recommended

Demo

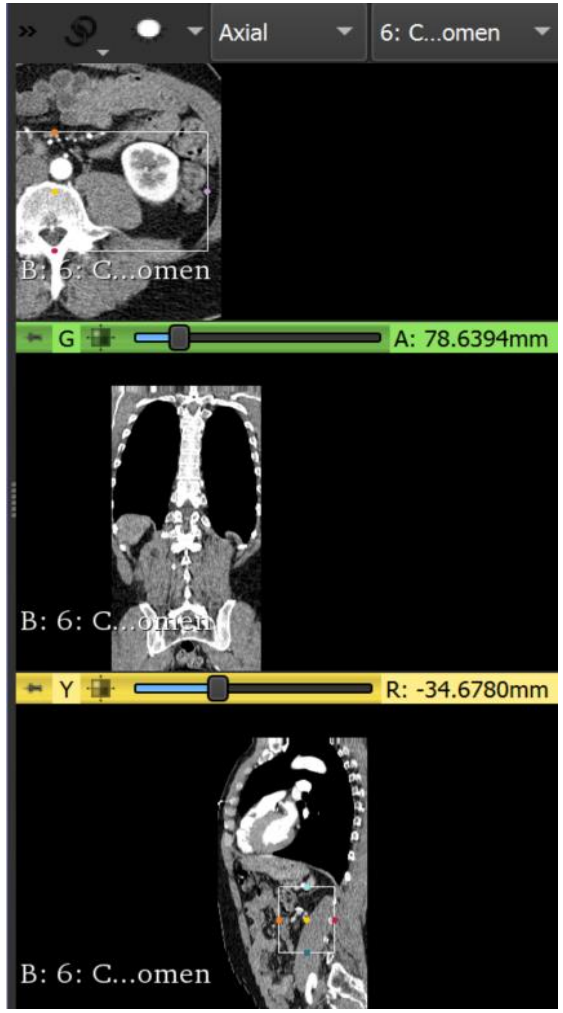
- 3D Visualization
- Segmentation
- Registration

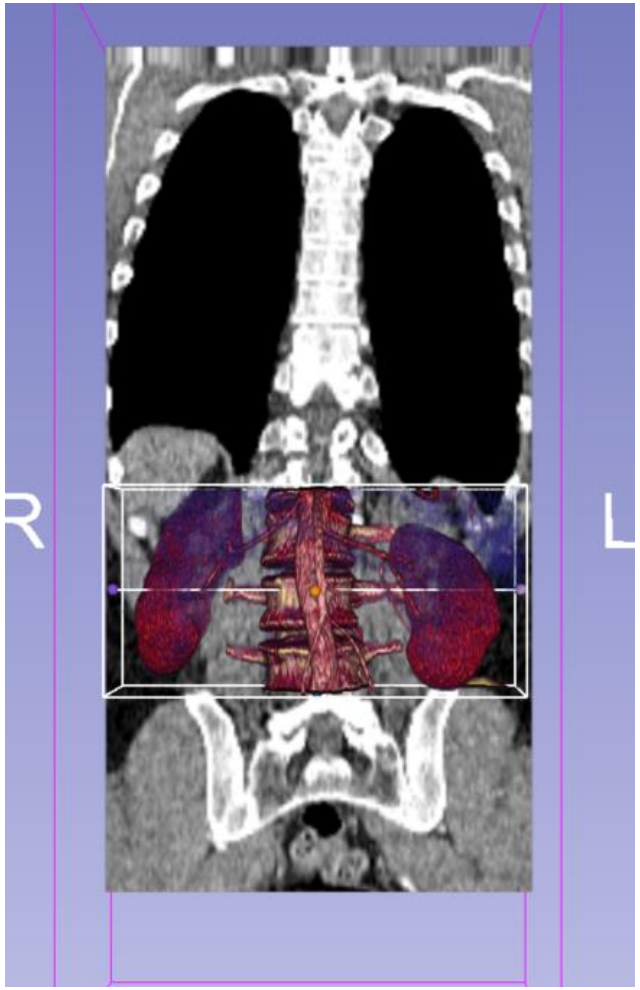
3D Visualization

- Loading and visualizing DICOM images
- Volume Rendering of CT scan data
- Loading and visualizing 3D models

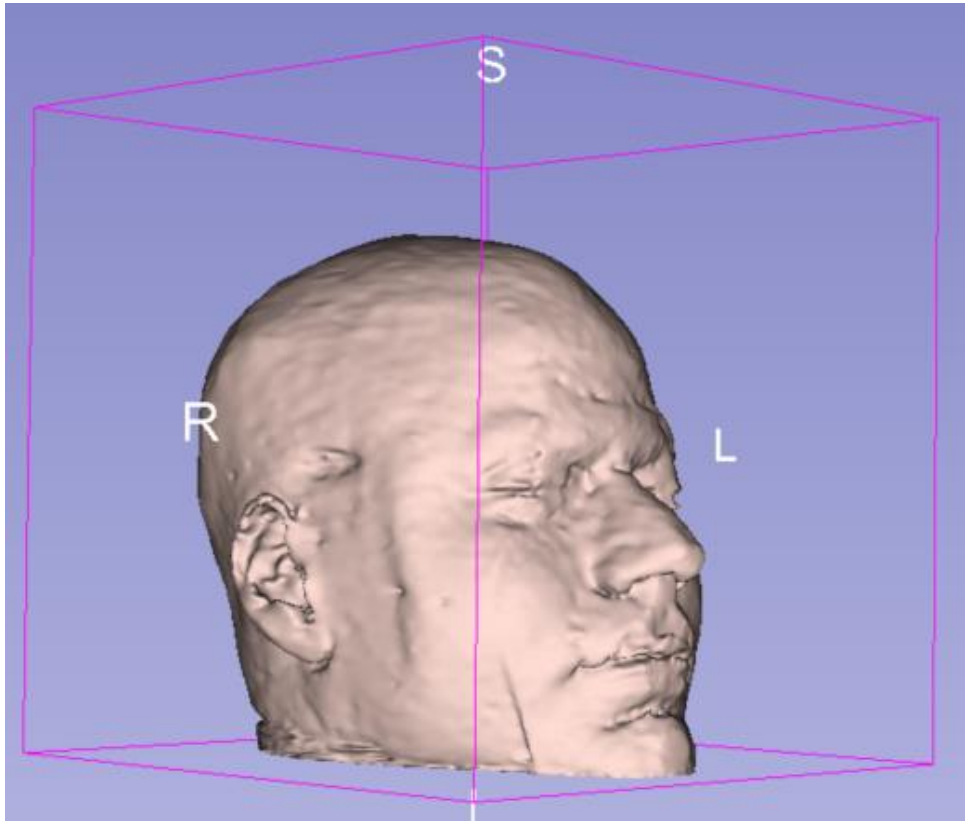
*DICOM = Digital Imaging and Communications in Medicine

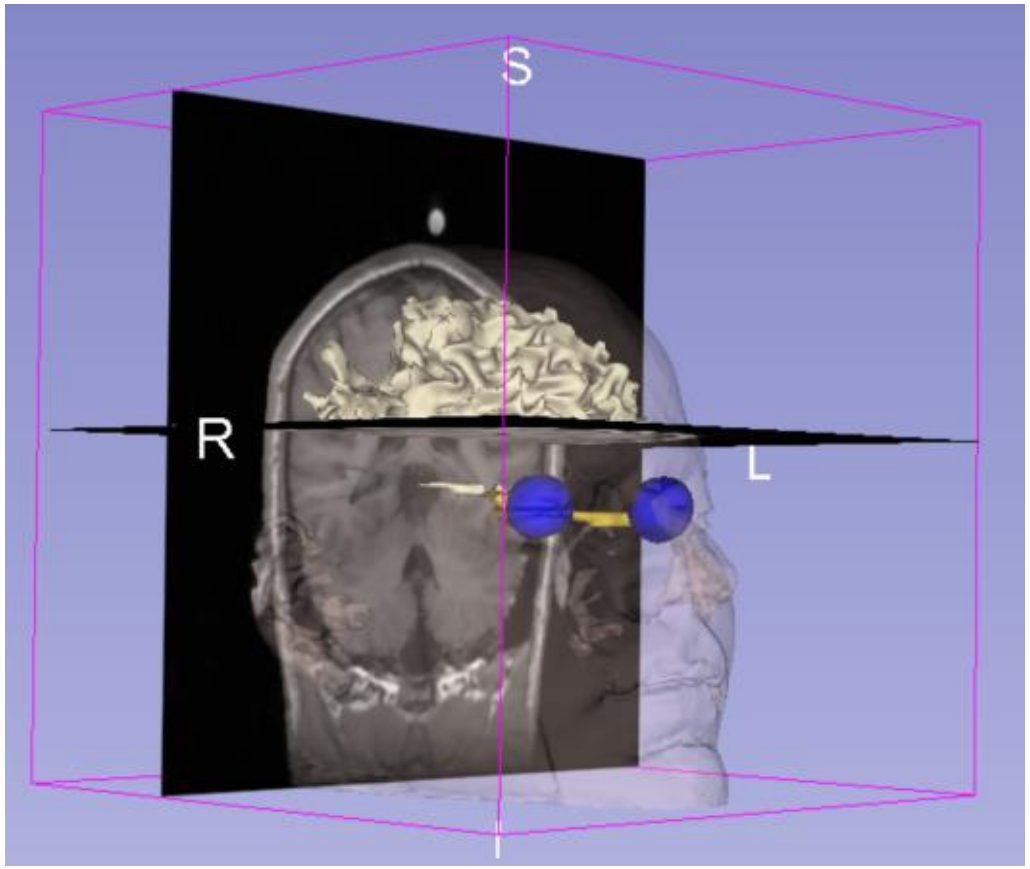
Volume Rendering





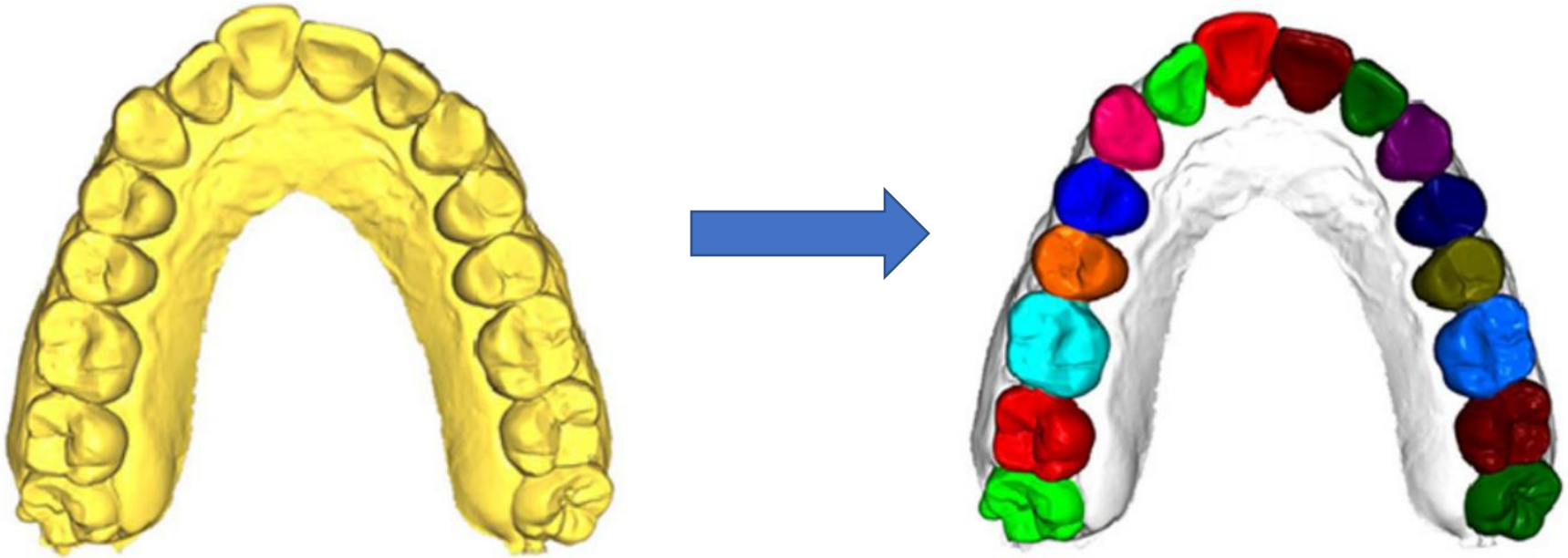
Visualizing 3D Models

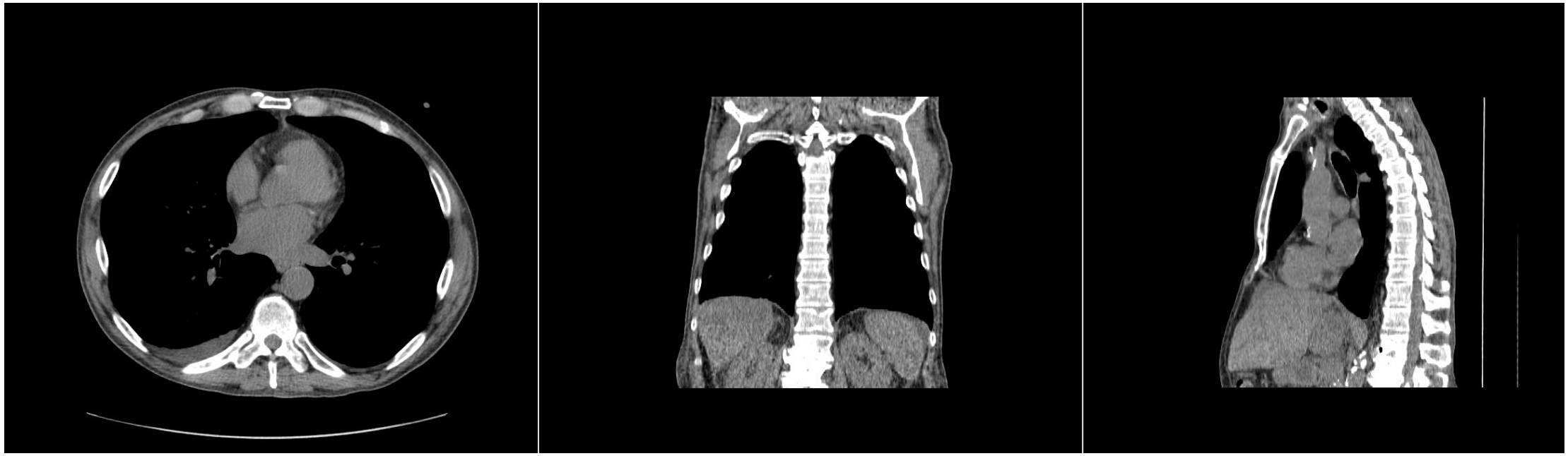




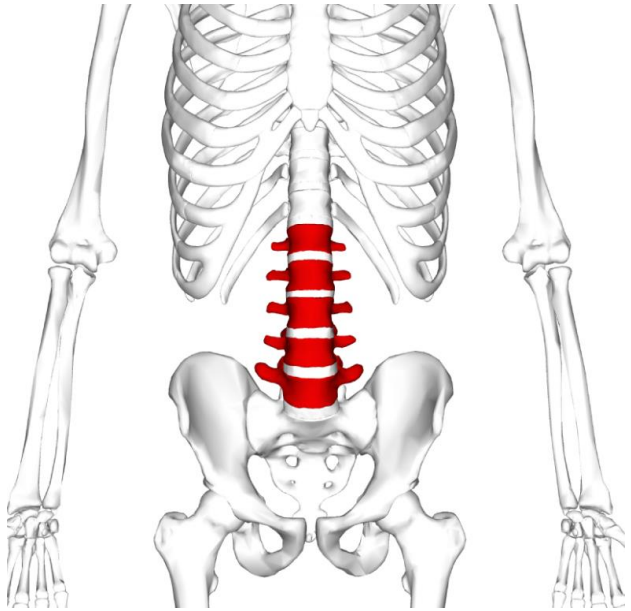
Segmentation for 3D printing

- **Segmentation:** With 3D image segmentation, data acquired from 3D imaging modalities such as CT, X-ray or MRI scanners is labelled to isolate regions of interest.

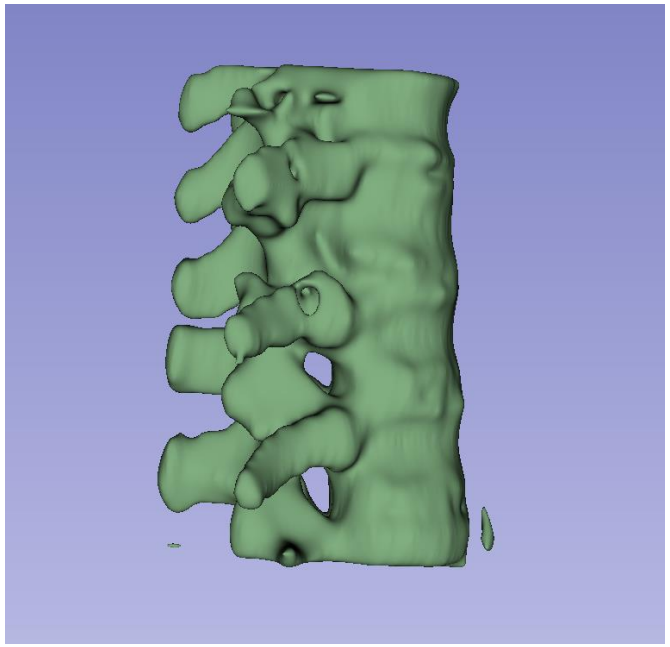




CT Scan of Chest



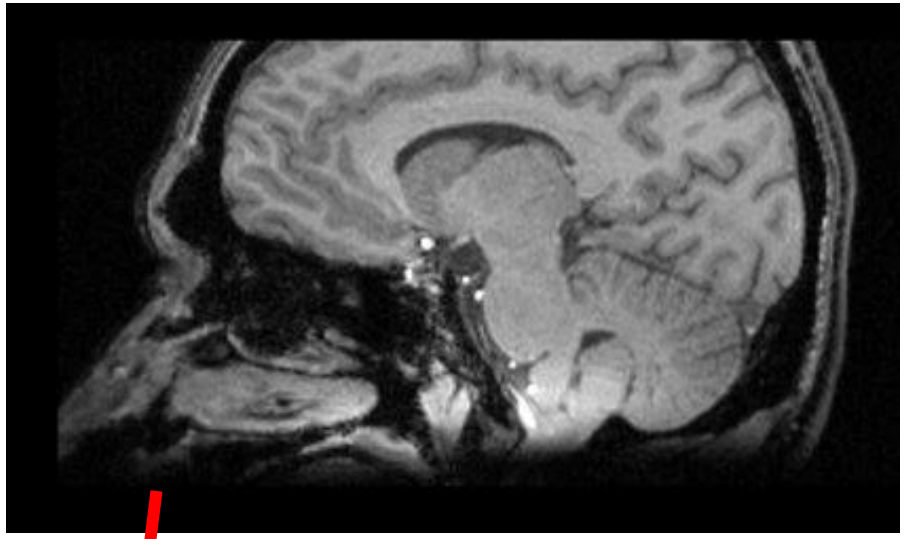
Lumbar Vertebrae



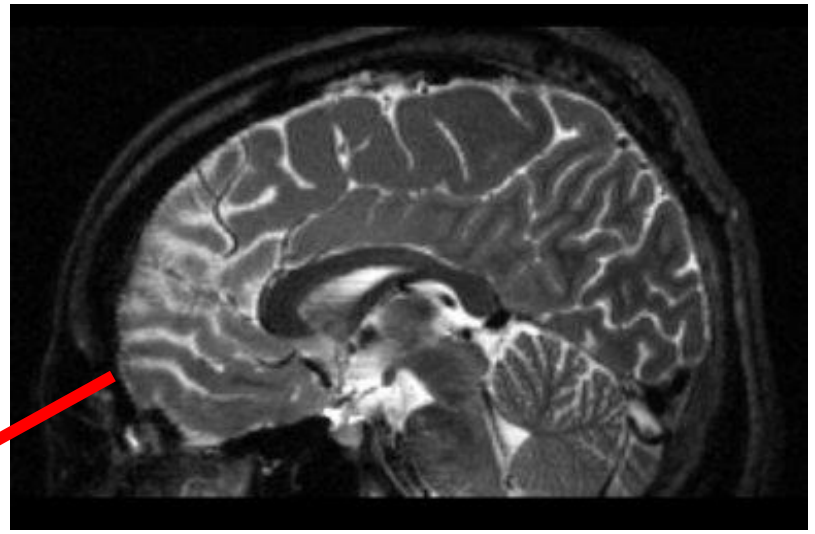
3D segment of Lumbar Vertebrae

Registration

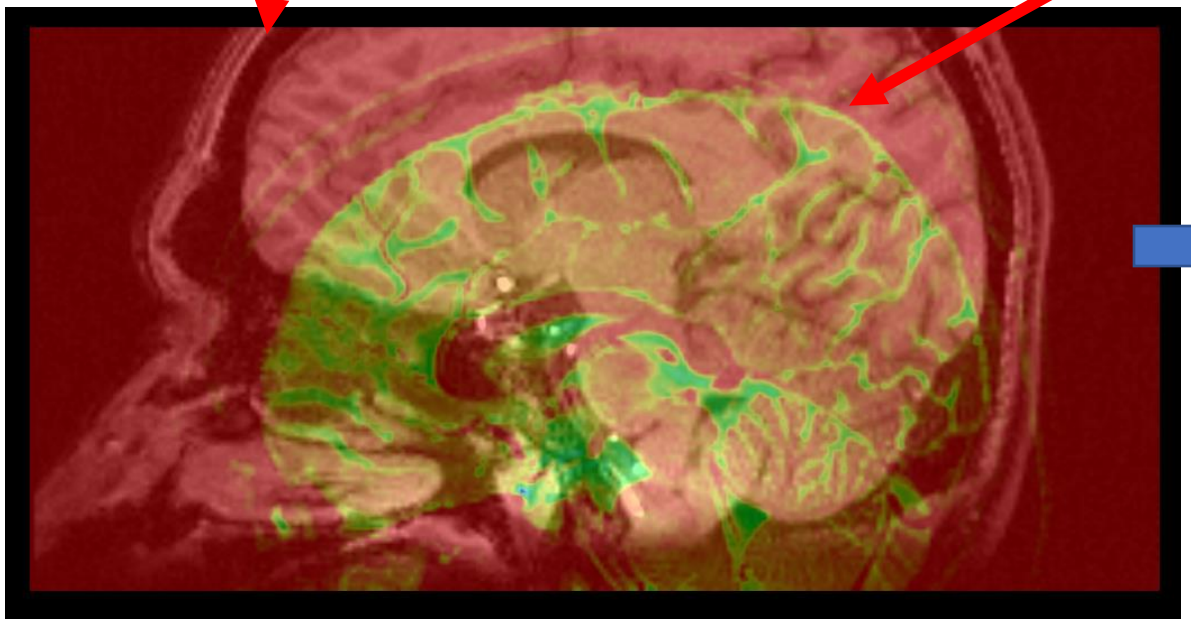
- Registration algorithms bring different image datasets into spatial alignment, in order to achieve anatomical agreement.



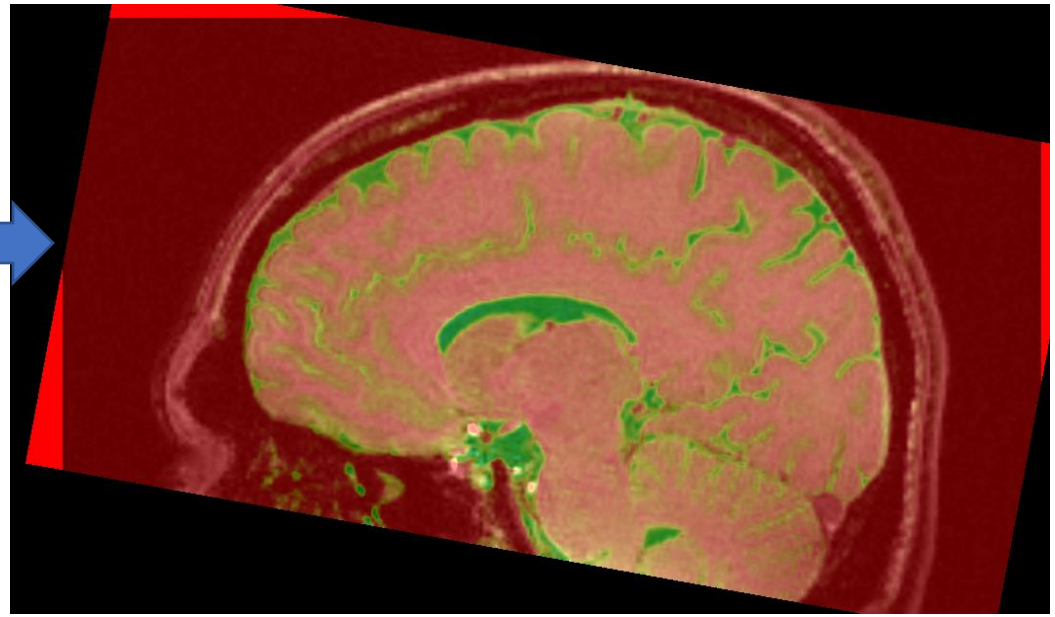
CT Scan T1



CT Scan T2



Before Registration - **Misaligned**



After Registration - **Aligned**

Pros

- Free access available
- Supported by multiple platforms: Linux, Mac OS, and Windows.
- Works with versatile data formats: DICOM files, images (nrrd, nii.gz, ...) and models (stl, ply, obj, ...) to tables (csv, txt) and point lists (json).
- Can be integrated with different image devices, such as MRI, CT scanners, and microscopes.
- A lot of presets are available for most common use cases
- Users can customize the platform by adding modules that suit them.
- Detailed documentation

Cons

- Not approved for clinical use and is meant for research, conditions that limit the usage in real situations.
  There are other competing products like Invivo which are FDA approved for clinical use.
- User Interface is not very flexible and a bit counter-intuitive which takes a while to get accustomed to.

Thank You