

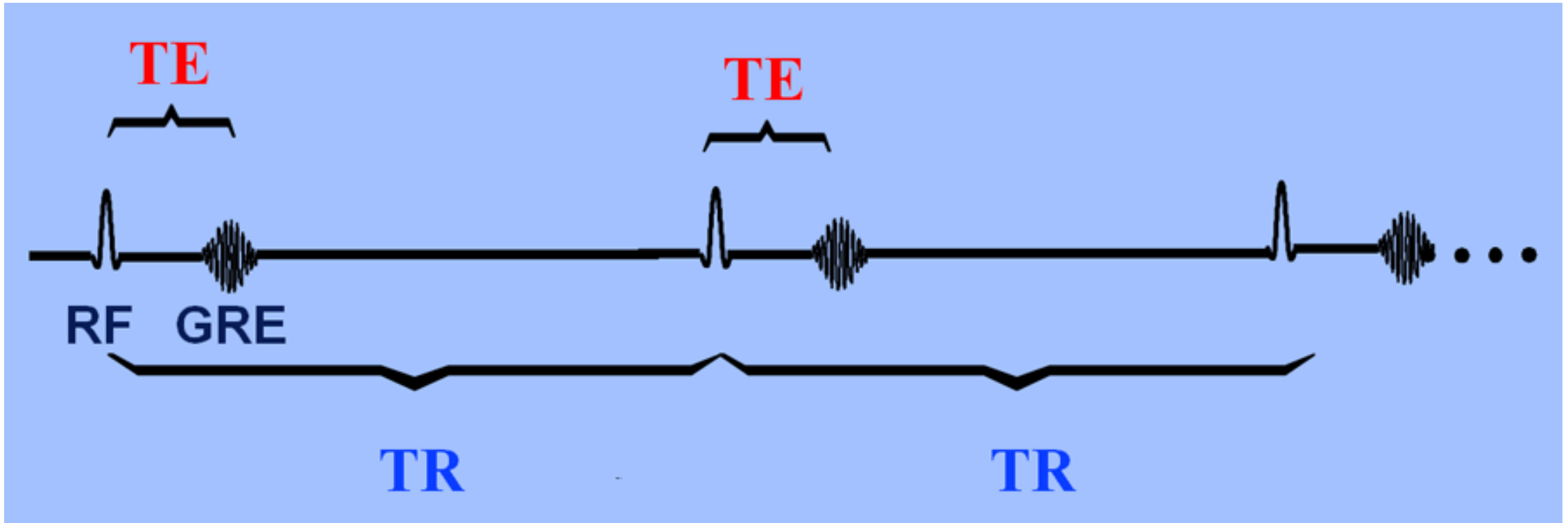
Understanding Neuroimaging data

17082024

Agenda

- Touch upon on MR sequences/parameters
- Types of MR scans and its comparisons
- Hands on (demos)
 - DICOM to NIFTI format
 - Anonymization
 - Unboxing NIFTI format images
 - Visualization of NIFTI images

What is TR and TE ?



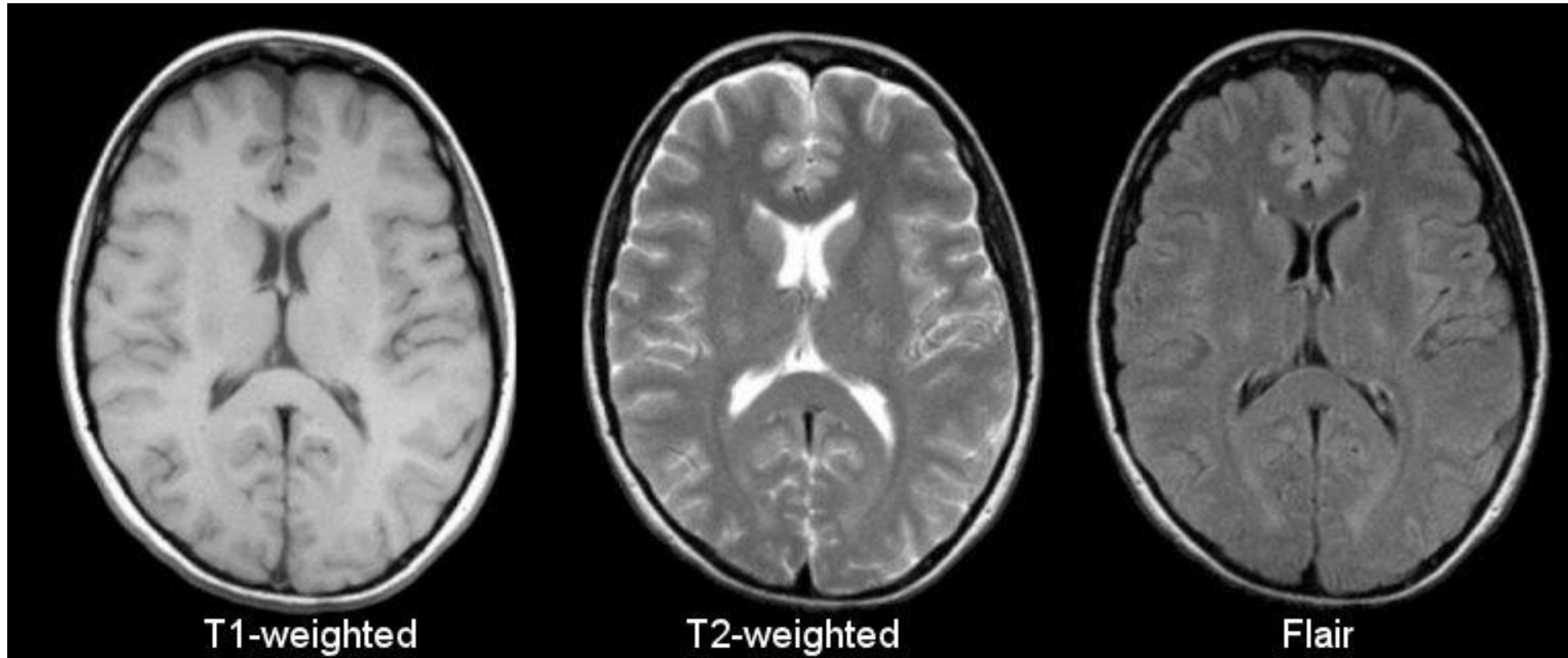
Hendrick RE (ed). [Glossary of MR Terms](#) (5th ed). Reston, VA: American College of Radiology, 2005.

MRI imaging sequences

- Imaging of the brain

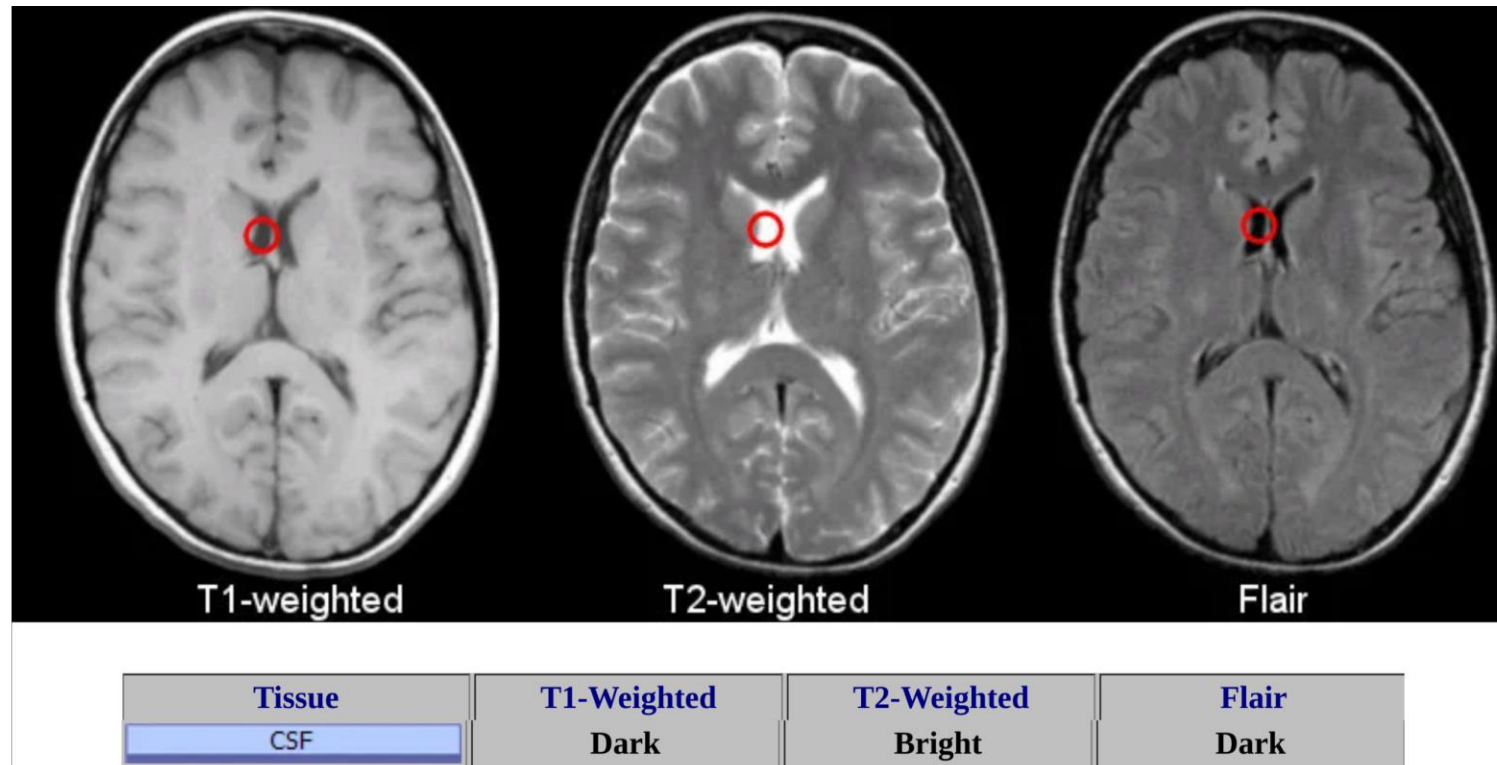
	TR (msec)	TE (msec)
T1-Weighted (short TR and TE)	500	14
T2-Weighted (long TR and TE)	4000	90
Flair (very long TR and TE)	9000	114

Types of MR scans



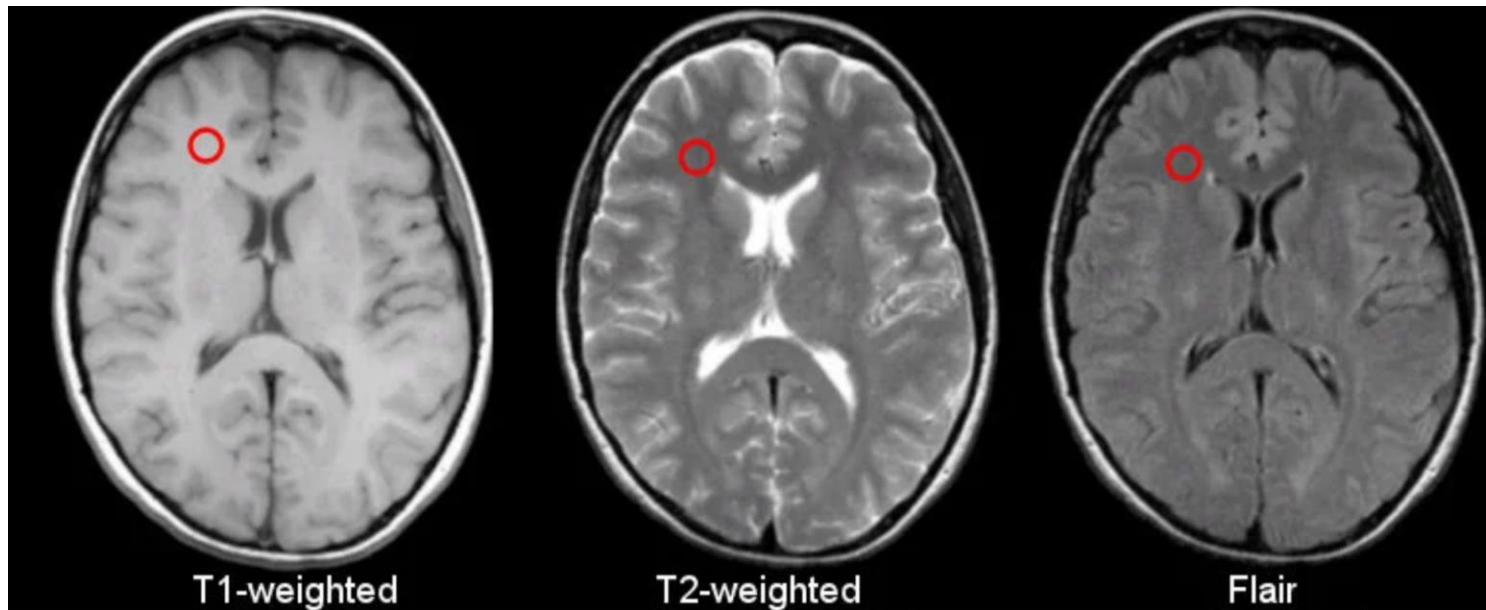
Types of Tissue in Anatomical MRI

- Cerebro Spinal Fluid (CSF)



Types of Tissue in Anatomical MRI

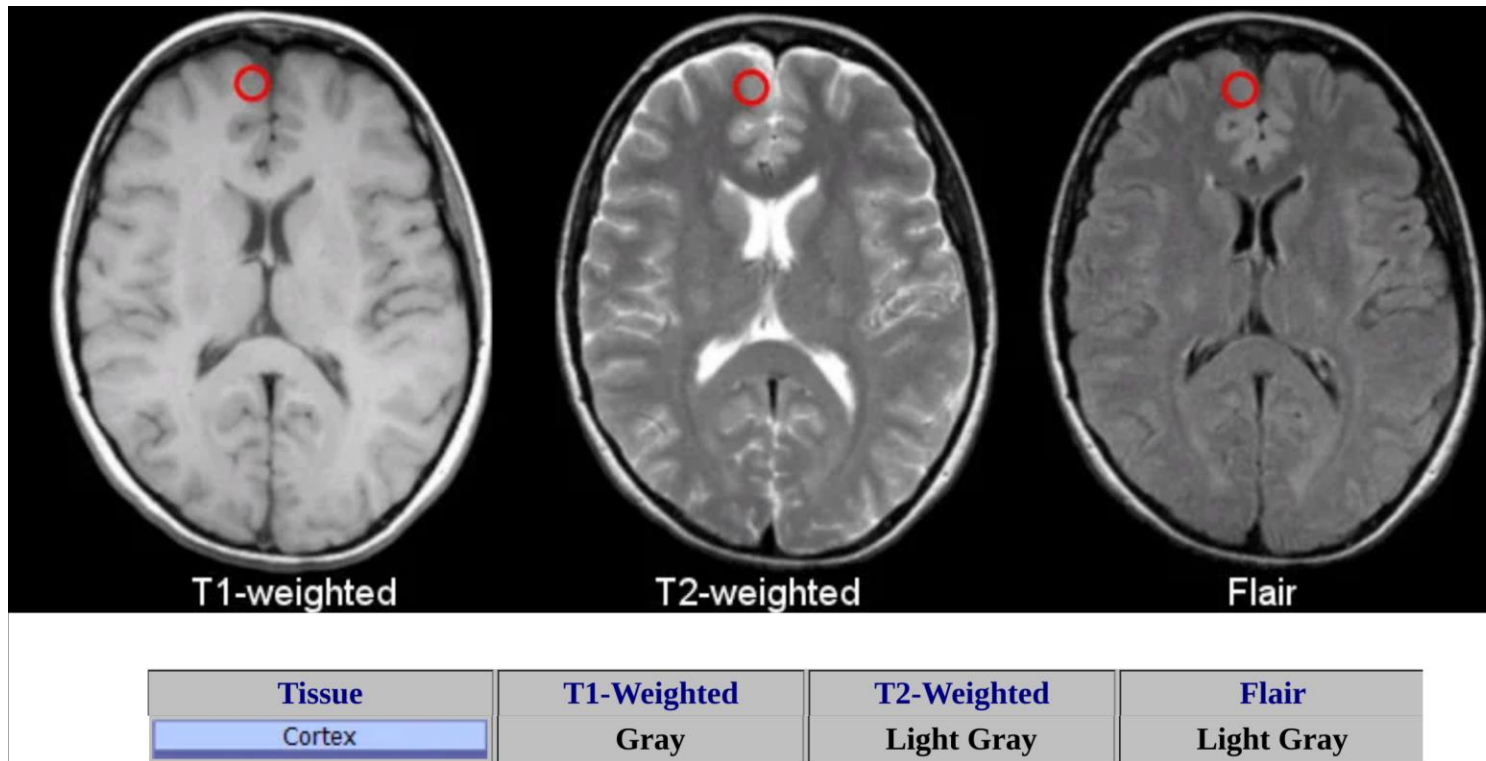
- White Matter (WM)



Tissue	T1-Weighted	T2-Weighted	Flair
White Matter	Light	Dark Gray	Dark Gray

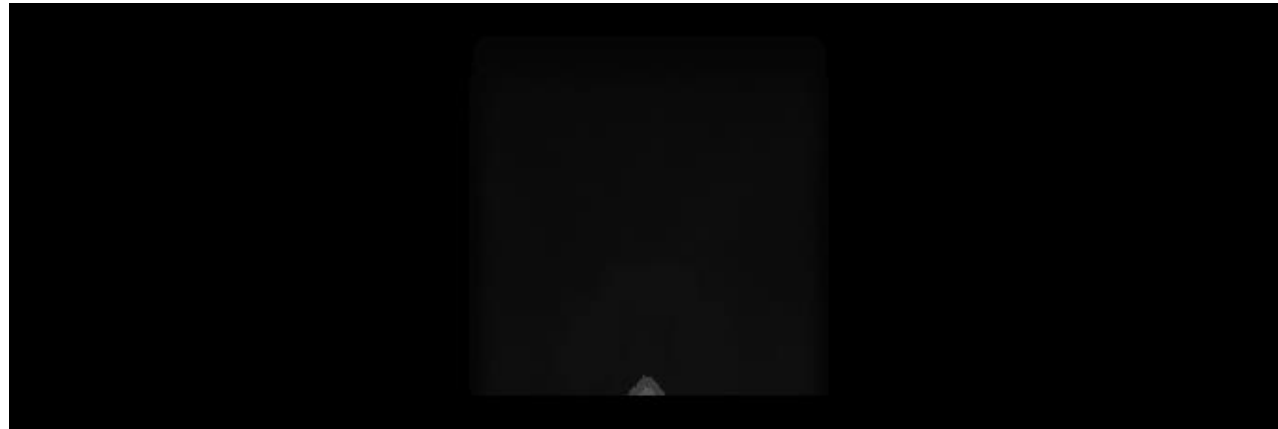
Types of Tissue in Anatomical MRI

- Grey Matter (GM)



Summary of Anatomical image

- 3D image of anatomy
 - Shape, volume, cortical thickness, brain ROIs
- Can differentiate between tissue types
- High resolution



MRI planes

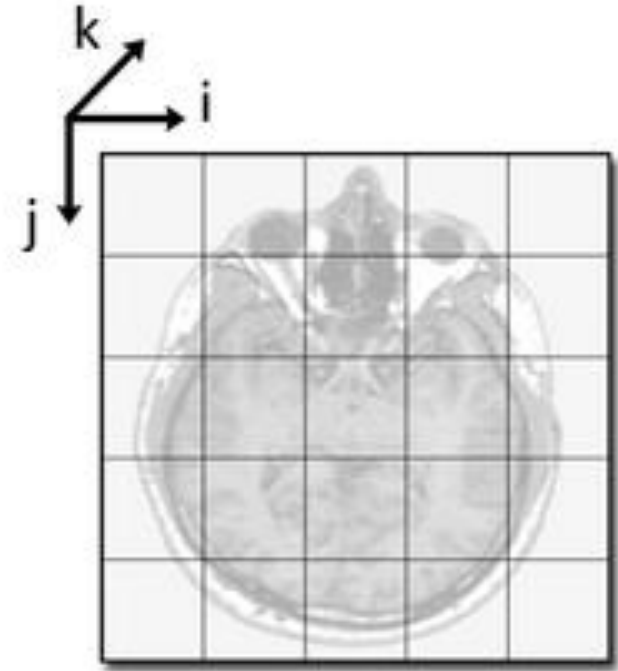
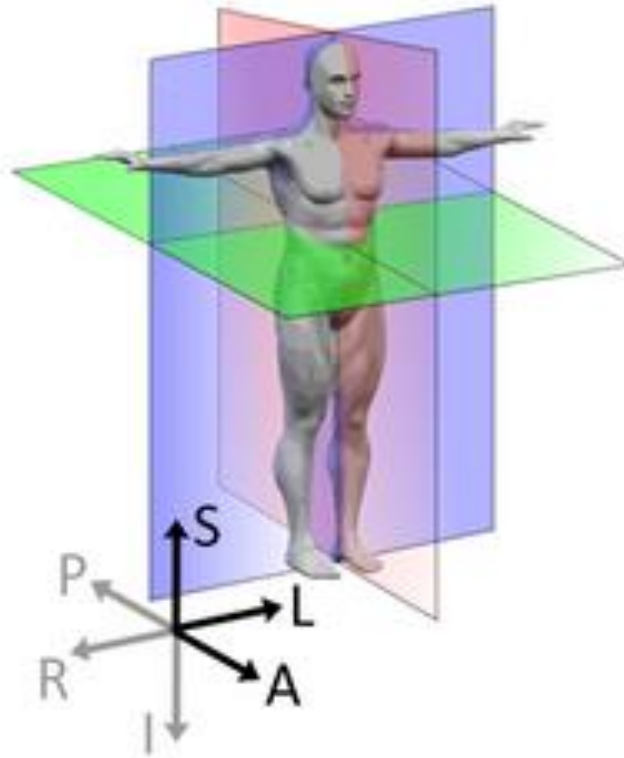
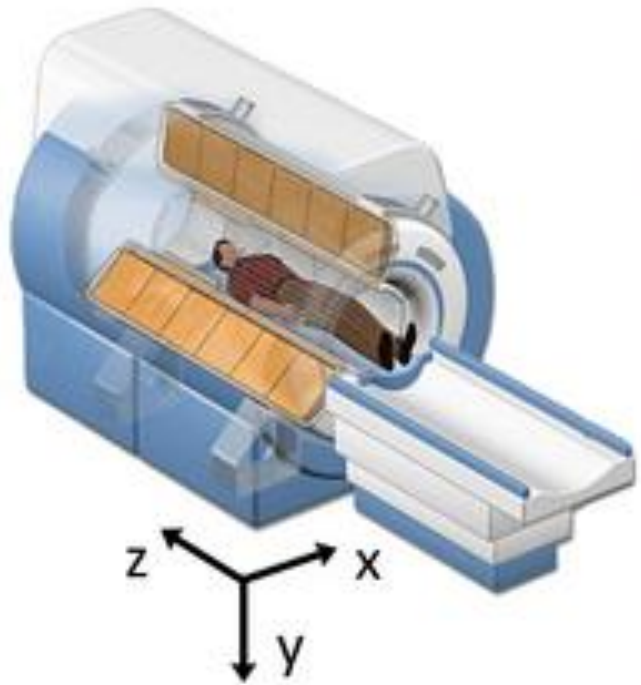


Axial

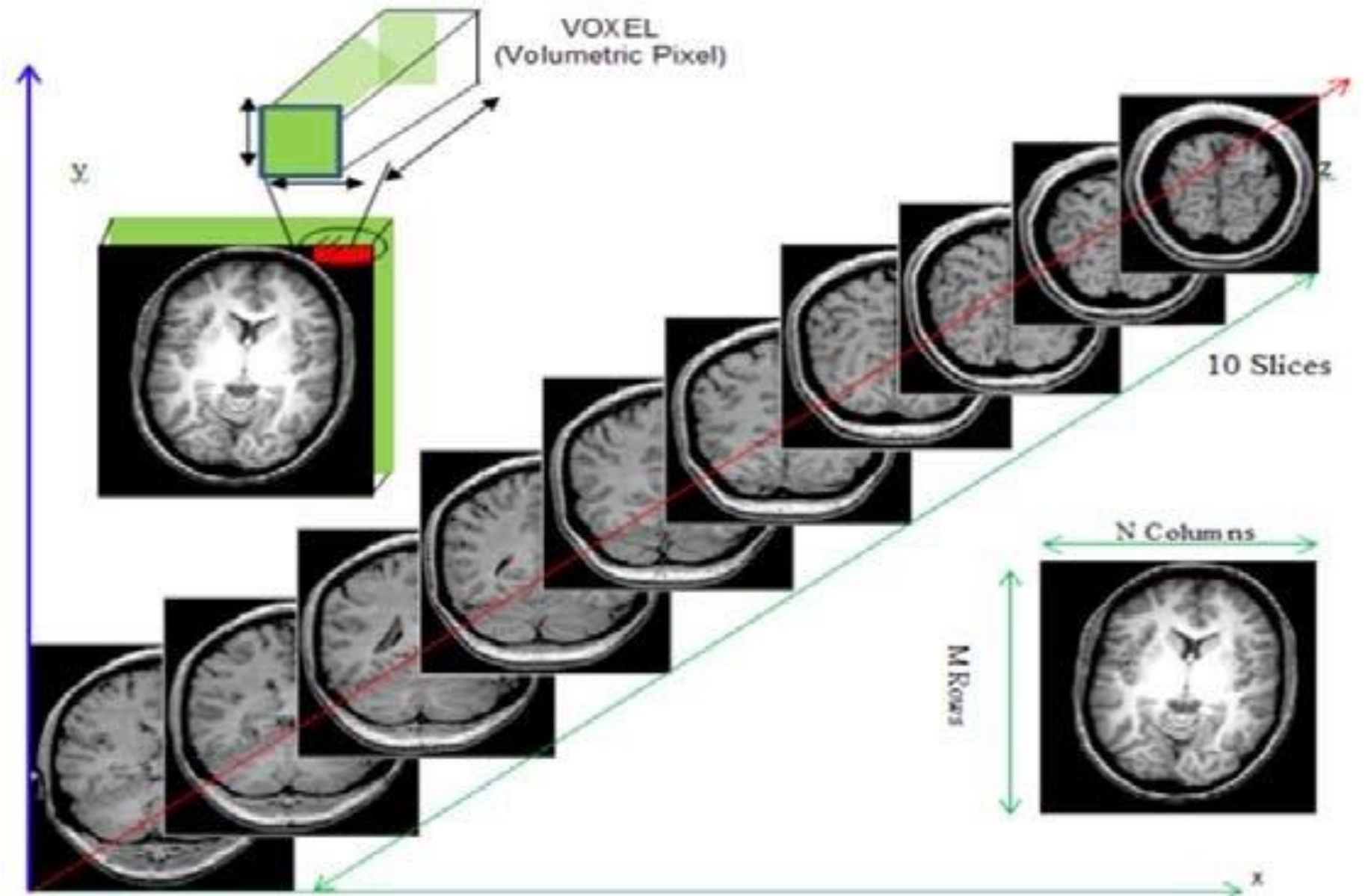
Coronal

Sagittal

MR Coordinates Systems



What a voxel is?



Practical demos

Summary

- In general,
 - Some terminologies
- Working with Nifti images in Python
- No fMRI and dMRI, not yet!!!
- DICOM to BIDS, not yet!!!