Artificial Intelligence

In Medical Diagnosis

BRAIN GLIOMA DETECTION THROUGH MRI SCAN USING CONVOLUTION NEURAL NETWORKS (CNN)

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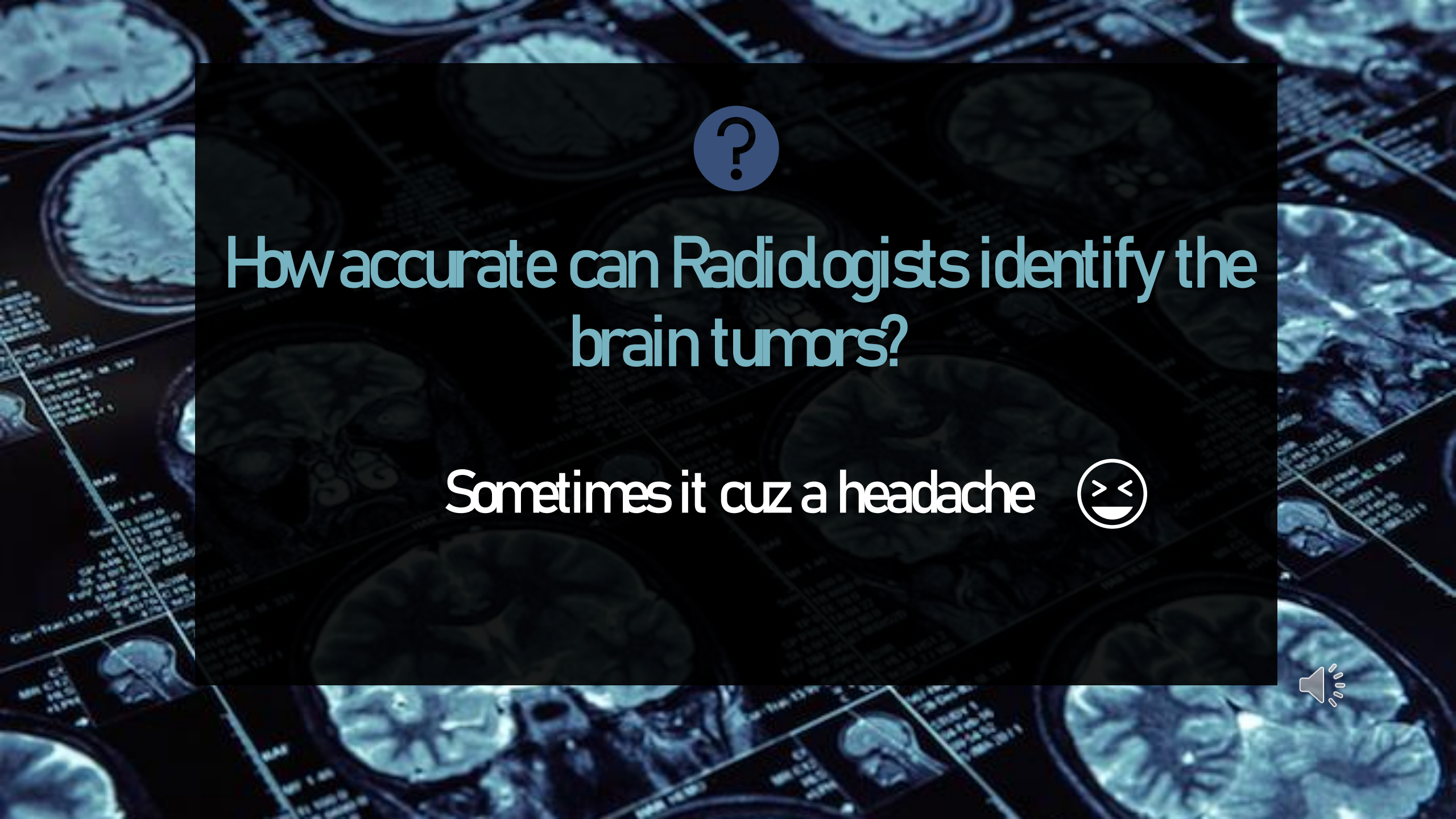
new native group

lab lab. ai

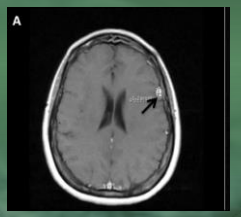

How accurate can Radiologists identify the brain tumors?
Sometimes it cuz a headache

Problems

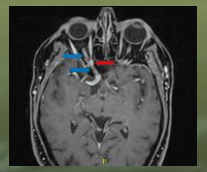
Lack of experience

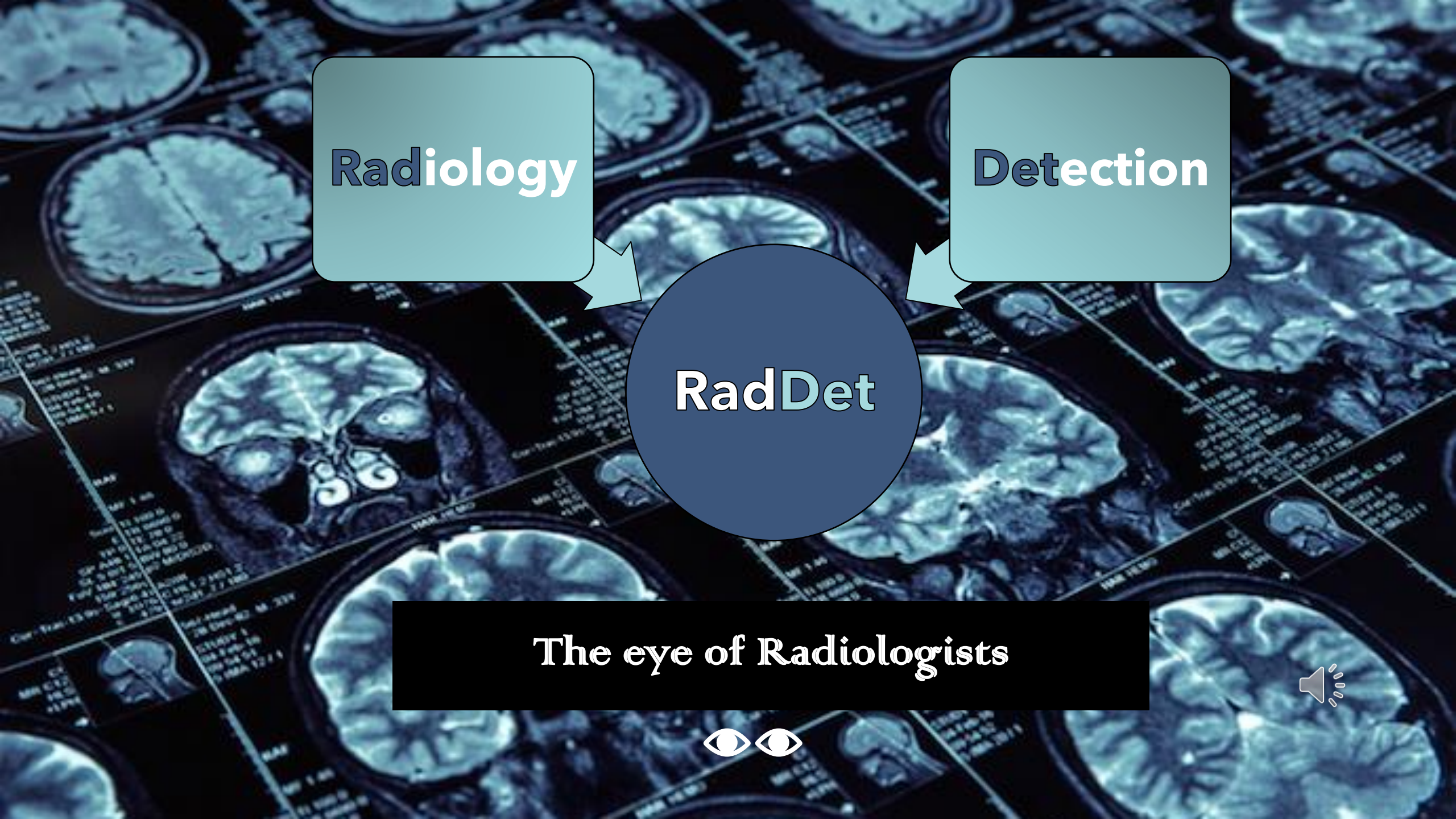
Long time

Small size



Difficult location




Radiology
Detection
RadDet
The eye of Radiologists

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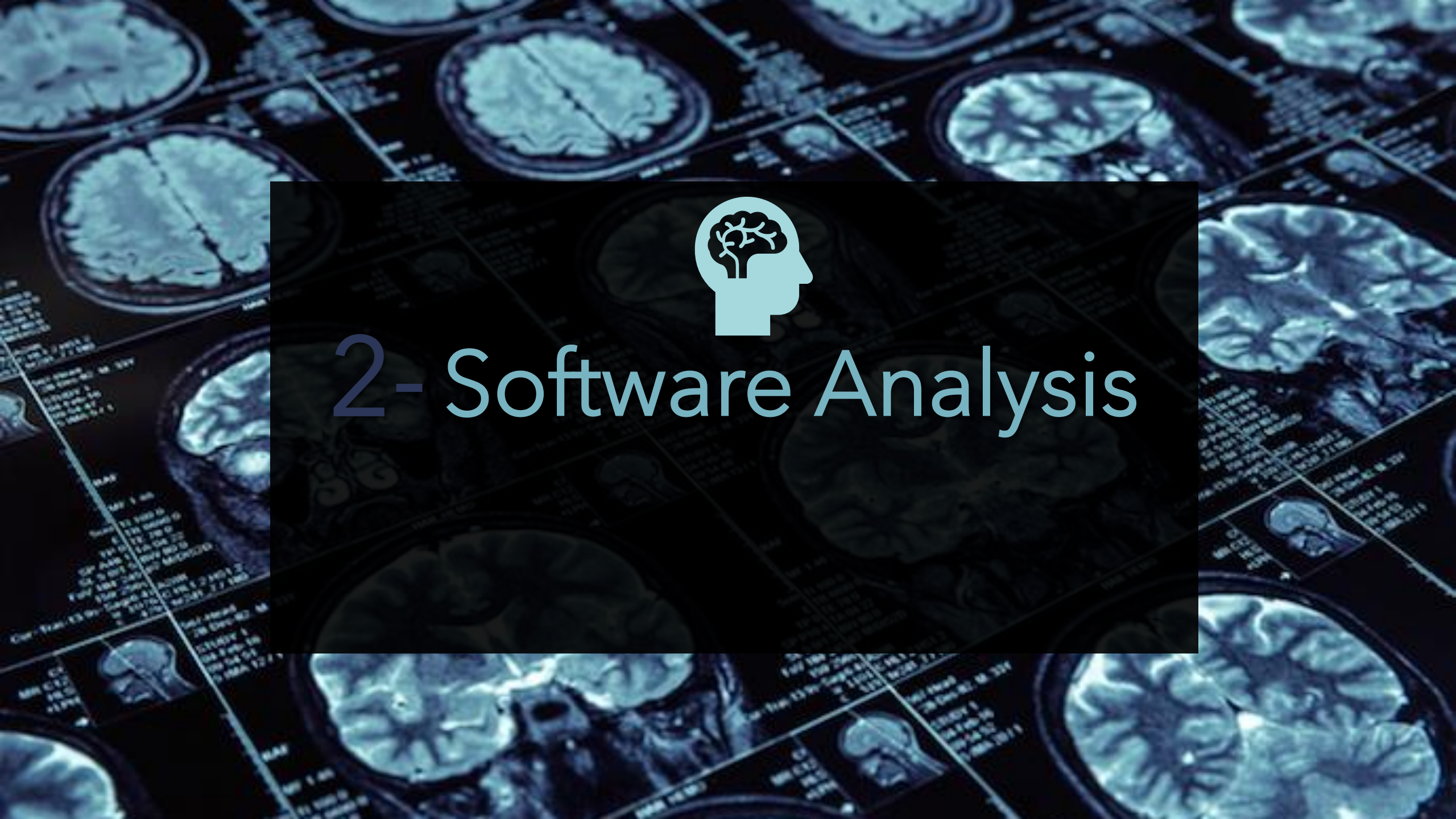
1 - Why & What?

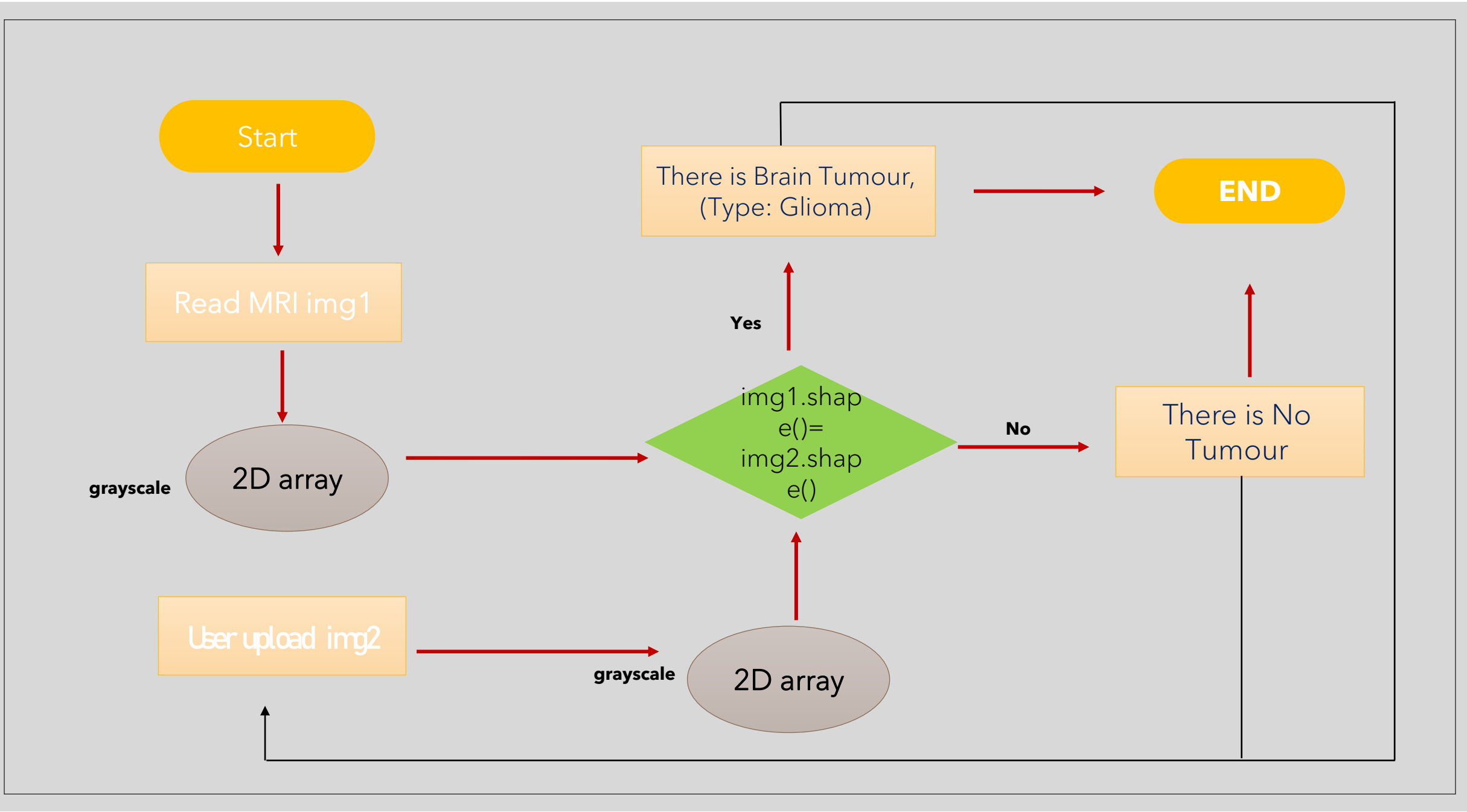
Why?

What RadDet?

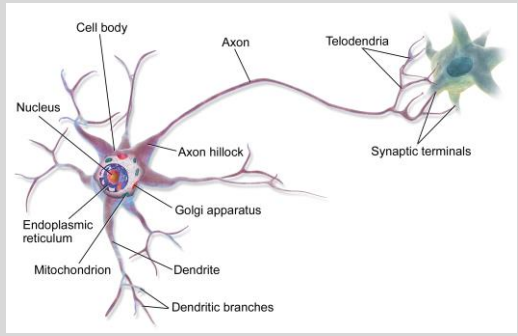
- Building an artificial intelligence **software** tool by using python codes (CNN).
- The tool aim to detect brain tumors called gliomas through the MRI images by using specific MRI sequences (FLIAR/ T2 / Diffusion weighted imaging “DWI”).



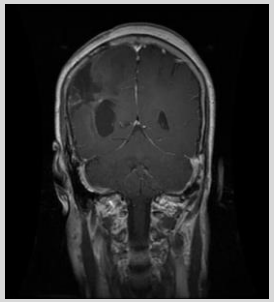
2- Software Analysis


Start
Read MRI img1
grayscale
2D array
User upload img2
grayscale
2D array
img1.shape()= img2.shape()
Yes
There is Brain Tumour, (Type: Glioma)
END
No
There is No Tumour

Convolutional Neural Network (CNN)



INPUT



convolutio n

Pooling

convolution

Pooling

FC

OUTPUT

Classification

3- Demo

3- Possible customers

Direct

- Radiologists
- MRI technologists
- Medical companies who interest in developing MRI tools such as (SIEMENCE / GE / PHILIPS…ETC).

InDirect

- Patients with brain tumors (gliomas).
- Radiology technicians
- Neuro- doctors
- Surgeons (pre-operation)

5- Business plan

Basic

- Detect the brain tumors (Glioma)
- Support only one sequence (T2 MRI image).
- Support only axial images

Professional

- Detect and localize the brain tumors (Glioma).
- Support multiple sequence (FLAIR/ T2/ DWI MRI image).
- Support axial, sagittal, and coronal MRI images.
- Writing a primary medical report.

6- Limitations & Next step

What *RadDet* needs?

Limitations & ↦ Next step for RadDet

- **The primary dataset used in the Demo has limited sequence (only (T2 MRI images))**

↦

It will used variety sequences for glioma such as (FLAIR/ DWI MRI images).

Limitations & ↦ Next step for RadDet

- **The dataset of MRI images from Kaggle.com**

↦

It will be extracted from Saudi hospitals after collaborating with Ministry of Health (MOH).

Limitations & ↦ Next step for RadDet

- The Demo displays a simple code by using OpenCV library

↦

The software will be based on a powerful Deep learning algorithm (CNN)

THANKS

Don't hesitate to ask about anything you need.

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Credits: MRI Images used in this project created by radiopedia.org & Kaggle.com