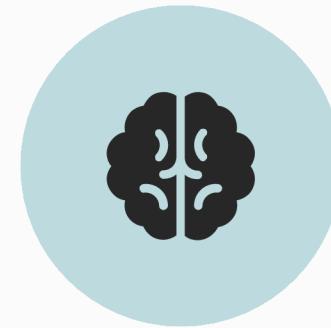
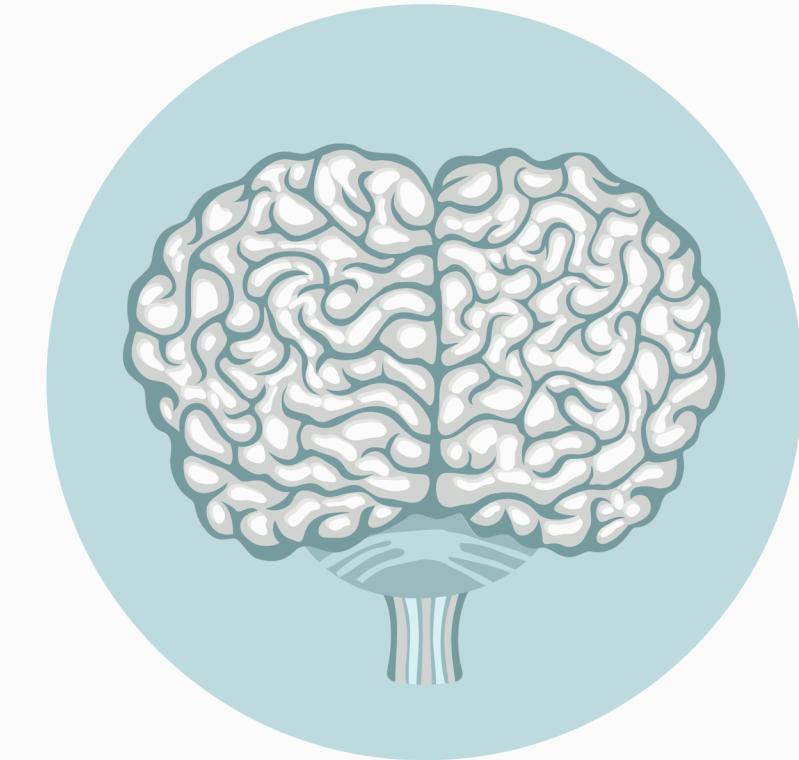


# **NeuroDetect**

## **Brain Tumour Detection System**

By Mayur Bhai

# Introduction



## Background

Brain tumours are common but challenging to detect, particularly in the early stages. Early detection is crucial, helping medical professionals select effective treatment options and saving lives.

## Importance

Using machine learning, how can we identify tumours in MRI scans to improve early detection, prevent further complications, and accelerate treatment planning?

# Impact



## Diagnostic

Reduce diagnostic times to identify the kind of tumour a patient has. Aid medical professionals in early detection and diagnostics



## Treatment

Reduce time for treatment planning. Early detection can in turn help curate a plan of action much quicker, resulting in more lives saved



## Patient Turnaround

Increase patient turnaround time due to faster tumour detection. Early detection speeds up initial processes, which in turn increases patient turnaround



## Cost

Minimizing costs linked to misdiagnoses and incorrect treatments. Having a robust detection system will reduce unnecessary costs for both patients and medical clinics

# Dataset



## MRI Scans

Dataset contains 7023 MRI images of brain tumours classified into 4 groups:

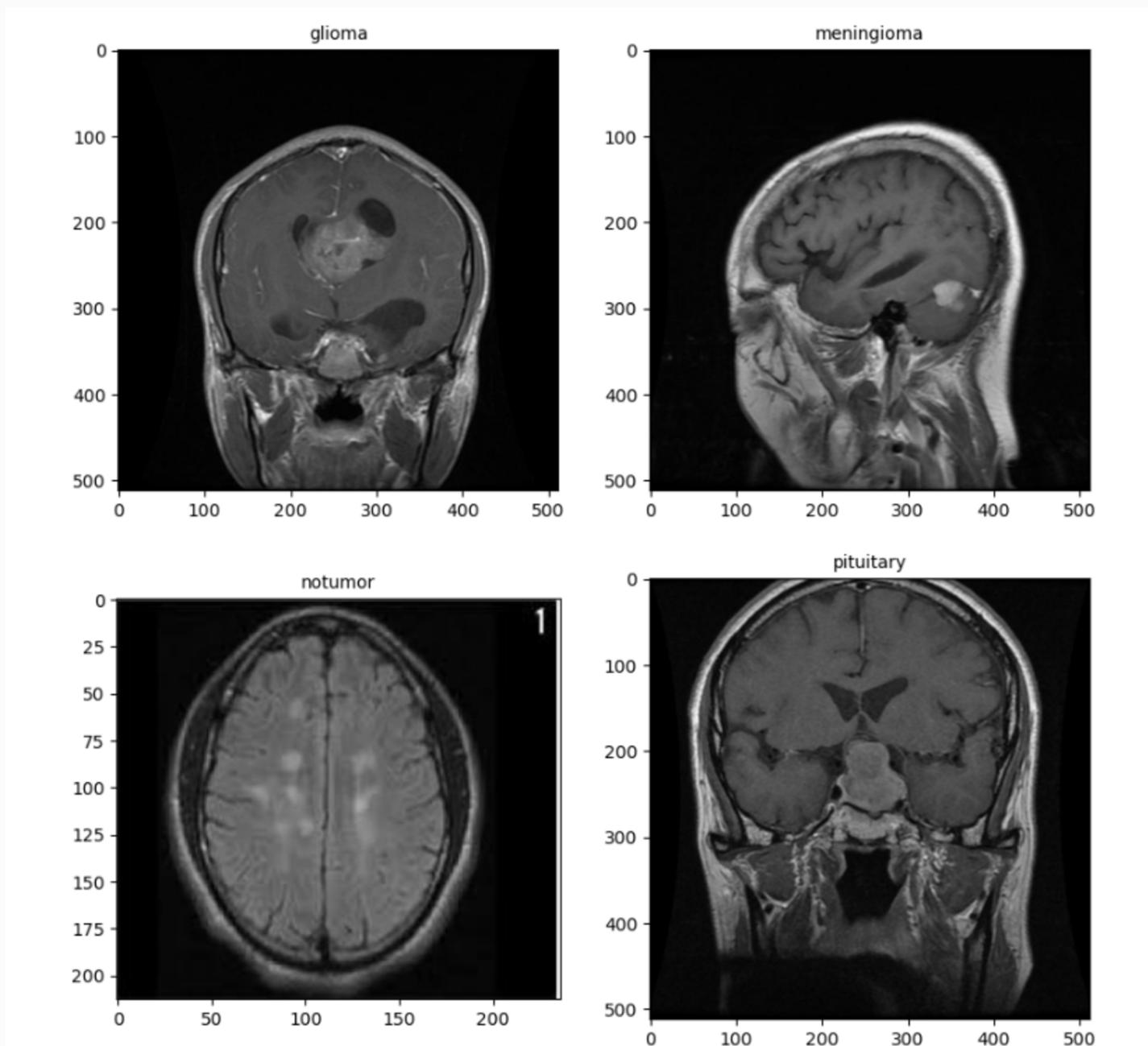
- Glioma
- Meningioma
- Pituitary
- Non Tumour



## Data Source

Dataset is a combination of three datasets, which were combined and collected from Kaggle.

- Figshare
- SARTAJ dataset
- Br35H dataset

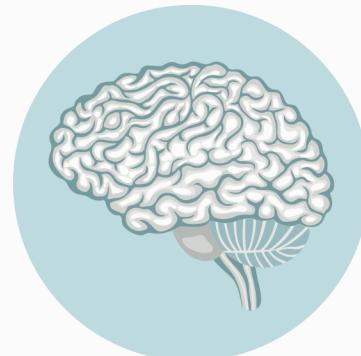


# Data Exploration

Preliminary exploration reveals the following:

- Image data distribution across classes is relatively even
- Scans are taken from different angles and brain segments
- Variations in image dimensions. Not all images are the same size
- No uniform resolution between images, majority are resolution of (512x512)

Uneven distribution could lead to one class influencing the model disproportionately, which would result in skewed predictions.



# Next Seps

## Data Preprocessing

Preprocess image data by resize image dimensions so they are consistent and normalize pixel values



## Model Selection/Feature Engineering

Select a suitable model, a CNN model would work best. Start to implement computer vision features, such as flatten, clustering or blur



## Model Training and Evaluation

Extensive hyperparameter tuning and in-depth model evaluation



# Thank You

Do you have any questions?



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