



# Brain Tumor Detection

Team Members: Kundrapu.Renuka durga  
Nagireddy.Hemalatha  
Peketi.Sivakanya  
Vannelaba.Varalaxmi

Guide : Abdul Aziz Sir

Disclaimer: The content is curated for educational purposes only.

# OUTLINE

- Abstract
- Problem Statement
- Aims, Objective & Proposed System/Solution
- System Design/Architecture
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Conclusion
- Future Scope
- References
- Video of the Project

## Abstract :

Detection and Classification of a brain tumor is an important step to better understanding its mechanism. Magnetic Reasoning Imaging (MRI) is an experimental medical imaging technique that helps the radiologist find the tumor region. However, it is a time taking process and requires expertise to test the MRI images, manually . Therefore This project bring forth the novel image processing based approach for the diagnosis of brain tumor . retaining the fine details as well as texture, and generates noise-free images.

The images undergoes the pre-processing function using adaptive noise fuzzy switching median filter. It removes the black and white noise in the input image while retaining the fine details as well as texture, and generates noise-free images.



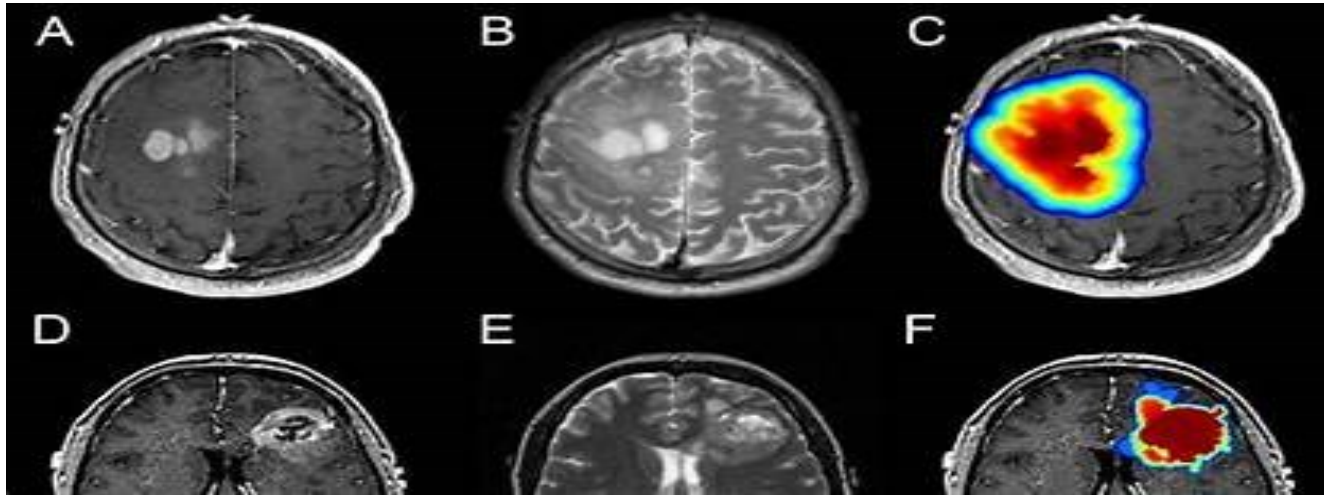
## Problem Statement :

Brain tumor is one of the deadliest illnesses which occurs due to the sudden and unregulated brain tissue growth inside the skull. It can be either benign or malignant. Malignant tumors can expand quickly and disperse across the surrounding brain tissue, whereas benign tumors tend to grow slowly. also be dangerous as their proliferation may affect surrounding brain tissues.so early diagnosis of a brain tumor is essential due to its deadly aspect



## Aim and Objective :

The main aim of brain tumor detection is to identify accurately and locate abnormal growths of tumor within the brain And Its main objective is to detect tumor at an early stage, enabling timely treatment and improving patient survival outcomes.

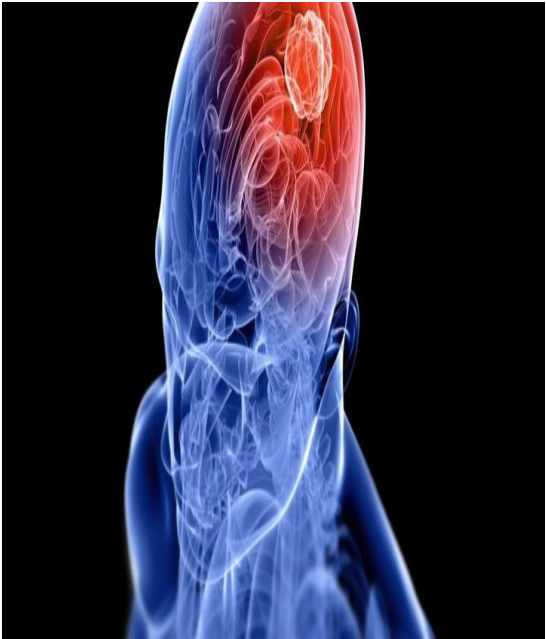


# Proposed Solution:

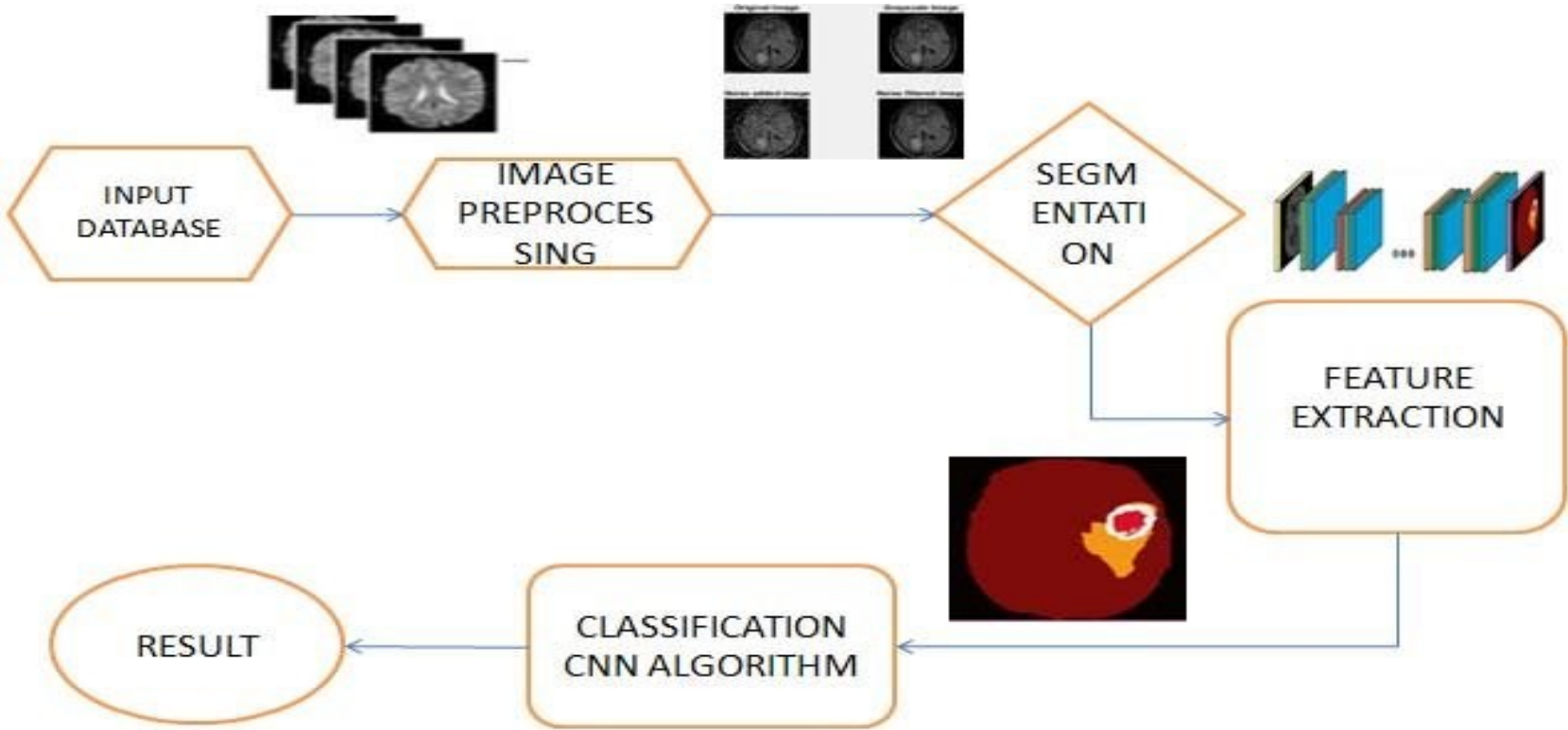
the main challenge lies in integrating effective image processing algorithms and machine learning models seamlessly into a web-based application. To address this, the project can leverage popular Python libraries such as TensorFlow or PyTorch for machine learning and OpenCV for image processing.

The Flask framework can be used to create a user-friendly web interface that allows users to upload MRI or CT scan images. On the server side, the uploaded images can be processed using pre-trained machine learning models for tumor detection. The predictions can then be communicated back to the user through the Flask web application. Proper documentation and modular code structure will also facilitate future updates and improvements.

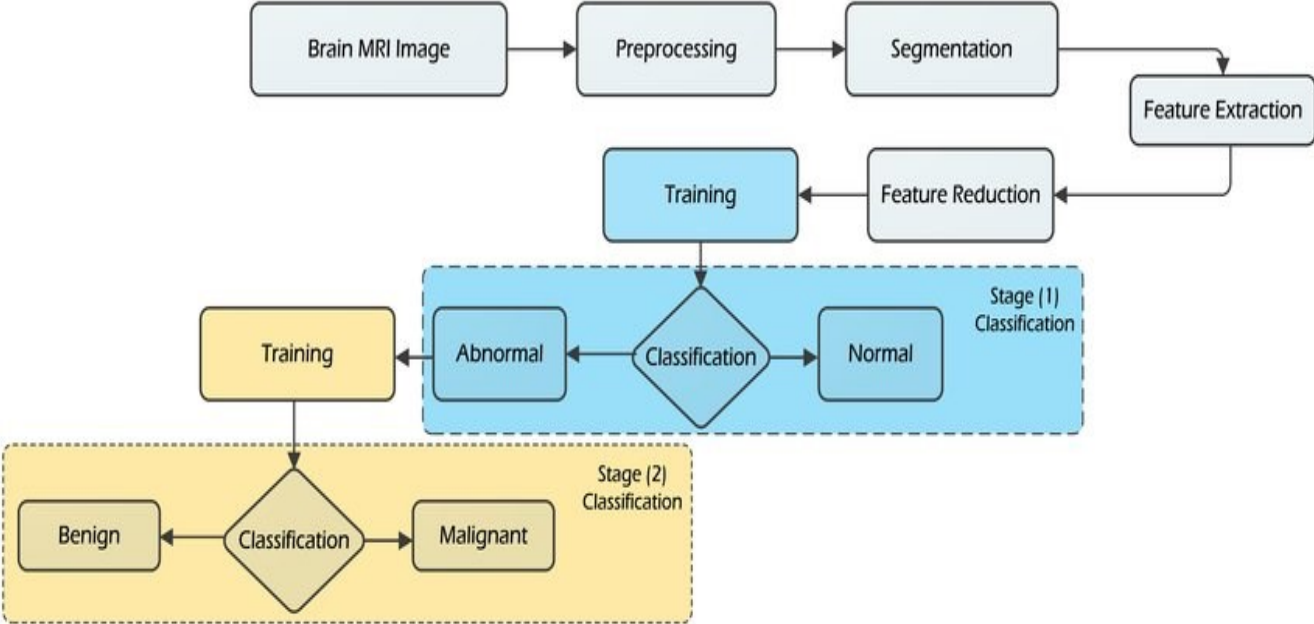
Overall, this solution ensures a smooth integration of brain tumor detection algorithms into a user-friendly web application using the Python and Flask stack



# System Architecture



# System Architecture





# System Deployment Approach:

**Developing a brain tumor detection system involves leveraging various technologies and methodologies.**

- **Data Collection:** Gather a diverse dataset of brain MRI or CT scans that contain tumor and non-tumor images.
- **Preprocessing:** Clean the images, normalize intensities, and resize them to a standard format.
- **Feature Extraction:** Utilize techniques like convolutional neural networks (CNNs) to automatically extract meaningful features from the images.
- **Model Training:** Train the model using labeled data, employing architectures like CNNs due to their effectiveness in image analysis .
- **Validation and Tuning:** Validate the model's performance using a separate dataset, fine-tuning hyperparameters if needed to enhance accuracy.
- **Deployment:** Implement the model into a user-friendly interface, potentially as a web or mobile application. Ensure it complies with healthcare regulations and maintains patient data privacy.

## Deployment:

- **Technology:** Utilize Python with libraries like TensorFlow, Keras, or PyTorch for model development.
- **User Interface :** Develop an intuitive interface for medical professionals to upload images and receive automated predictions .
- **Validation:** Collaborate with medical experts to validate the system's accuracy and ensure it aligns with medical standards .
- **Ethical Considerations:** Prioritize patient data privacy and ensure compliance with medical regulations (like HIPAA in the US) when handling medical information.

# Algorithm & Deployment:

- 1. **Backend development** : Setup, Model Integration, Data Handling
- 2. **Frontend development** : UI- Design, Upload Functionality, Display results
- 3. **Deployment:** flask deployment, integration and security
- 4. **Techologies:** flask, html & css , machine learning, deployment services



## Conclusion:

- Brain tumor MRI image is applied to preprocessing and after the tumor extracted through training and testing in ml.
- The medical image detection has difficulties in detecting complex structure with uneven shape, size and properties.
- For accurate diagnosis of tumor patients, appropriate detection method is required to be used for MRI images and carry out an improved diagnosis and treatment.
- The brain tumor detection is a great help for the physician as a boon for a medical imaging and industries working on the production of MRI images

## Future Scope:

Although our proposed models achieved promising classification outcomes, there are still a number of issues that can be resolved in the future work . for example,

- Improvement in ml models
- Focusing on developing algorithms capabilities so Early – stage detection tumor can be detected.
- Multi-modal fusion so that we input multiple images such as MRI,CT,PET..
- Improving python code so user can see the image of Brain tumor that is detected



## Reference

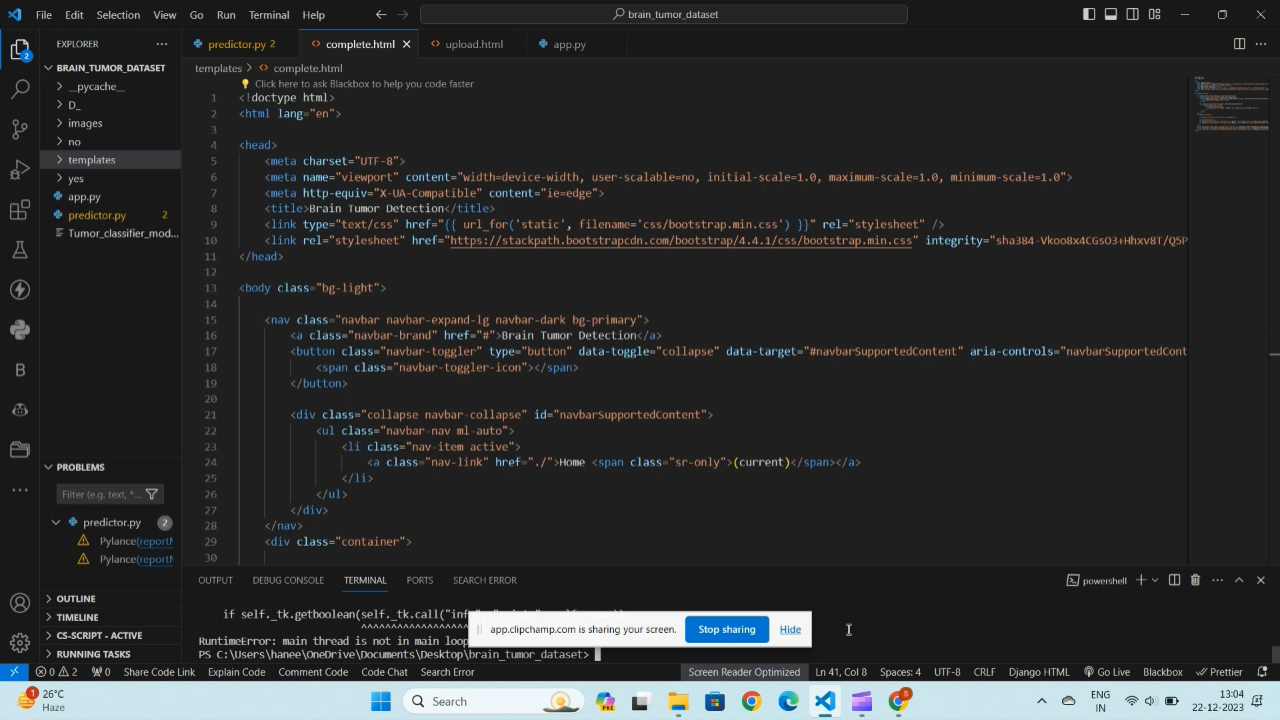
- [https://github.com/MohamedAliHabib/Brain-Tumor-Detection/blob/master/.ipynb\\_checkpoints/Brain%20Tumor%20Detection-checkpoint.ipynb](https://github.com/MohamedAliHabib/Brain-Tumor-Detection/blob/master/.ipynb_checkpoints/Brain%20Tumor%20Detection-checkpoint.ipynb)
- <https://www.youtube.com/watch?v=Gc6MSamMtRo>

Upload MRI image of Brain:

No file chosen

Check Tumor Status

vedio







**Thank you!**