

## **MRI IMAGE For Tumor Diagnostics Using Machine Learning**

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### **Abstract**

A brain tumor is a mass or growth of abnormal cells in our brain. Many different types of brain tumors exist. Some brain tumors are noncancerous (benign), and some brain tumors are cancerous (malignant). Brain tumors can begin in your brain (primary brain tumors), or cancer can begin in other parts of your body and spread to your brain (secondary, or metastatic, brain tumors). Brain tumor treatment options depend on the type of brain tumor you have, as well as its size and location. The classification of brain tumors is performed by biopsy, which is not usually conducted before definitive brain surgery. The improvement of technology and machine learning can help radiologists in tumor diagnostics without invasive measures. A machine-learning algorithm that has achieved substantial results in image classification is the convolutional neural network (CNN). It is predicted that the success of the obtained results will increase if the CNN method is supported by adding extra feature extraction methods and classify successfully brain tumor normal and abnormal image. **Keywords - CNN, Gliomas, Brain Tumor**

### **I. INTRODUCTION**

A brain tumor is a mass or growth of abnormal cells in our brain. Many different types of brain tumors exist. Some brain tumors are noncancerous (benign), and some brain tumors are cancerous (malignant). Deep learning is a branch of machine learning which is completely based on artificial neural networks, as neural network is going to mimic the human brain so deep learning is also a kind of mimic of human brain. Deep learning is a particular kind of machine learning that achieves great power and flexibility by learning to represent the world as a nested hierarchy of concepts, with each concept defined in relation to

simpler concepts, and more abstract representations computed in terms of less abstract ones. The human brain is the command center for the human nervous system. It receives signals from the body's sensory organs and outputs information to the muscles. The human brain has the same basic structure as other mammal brains but is larger in relation to body size than any other brains.

## II. MATERIALS AND METHODS

### A.Types Of Brain Tumor

There are over 100 types of cancer that can affect the CNS.As mentioned previously, cancers that arise in other locations (breast, lung, etc.) and spread (metastasize) to the brain are not considered brain cancer. They are still treated as the cancers of the original site. we will only discuss primary brain cancers.

#### (i) Gliomas:

Malignant gliomas are the most common and deadly brain cancers. They originate in the glial cells of the central nervous system (CNS). Gliomas can be divided into 3 main types Astrocytomas ,Oligodendrogliomas & Ependymomas

#### (ii) Nongliomas:

Nongliomas are tumors that do not arise from glial cells. More prevalent examples of nongliomas include meningiomas and medulloblastomas

## III. RESULTS AND DISCUSSIONS

### A. Brain Tumor Treatment:

The classification of brain tumors is performed by biopsy, which is not usually conducted before definitive brain surgery. The improvement of technology and machine learning can help radiologists in tumor diagnostics without invasive measures A machine-learning algorithm that has achieved substantial results in image

classification is the convolutional neural network (CNN).

## **B. Loading The Given**

### **Brain Tumor Image**

The data set is imported using keras preprocessing image data generator function also we create size, rescale, range, zoom range, horizontal flip. Then we import our image dataset from folder through the data generator function. Then we make folders as train, test, and validation also we set target size, batch size and class-mode from this function we have to train of brain tumor.

## **C. Training The Given Tumor**

### **Image Using CNN**

The dataset that is the images brain tumor and normal is collected and the LeNet CNN is applied on the model and the accuracy and graph is collected.

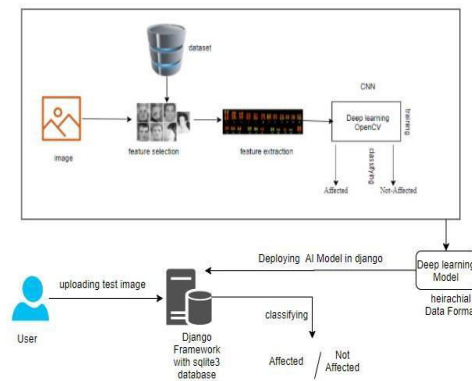
## **D. Working Of Algorithm And**

### **H5 File Generation**

In this module we train the neural network by giving the images by giving more epochs to train better

A brain tumor is an abnormal growth of cells inside the brain or skull; some are benign, others malignant. Tumors can grow from the brain tissue itself (primary), or cancer from elsewhere in the body can spread to the brain (metastasis). Treatment options vary depending on the tumor type, size and location. Treatment goals may be curative or focus on relieving symptoms. Normal cells grow in a controlled manner as new cells replace old or damaged ones. For reasons not fully understood, tumor cells

reproduce uncontrollably. Tumors can affect the brain by destroying normal tissue, compressing normal tissue, or increasing intracranial pressure. Symptoms vary depending on the tumor’s type, size, and location in the brain. and the .h5 file (Hierarchical Data Format) is generated and the model is loaded and is tested by giving input



**Fig 3.1. Architecture Diagram**

#### IV. CONCLUSION AND FUTURE ENHANCEMENT

It focused how image from given dataset (trained dataset) in field and past data set used predict the pattern of brain tumor using CNN model. This brings some of the following insights about tumor prediction. We had applied different type of CNN compared the accuracy and saw that LeNet makes better classification and the .h5 file is taken from there and that is deployed in Django framework for better user interface. for future we will be able to deploy this real time process by showing

the prediction result in web application or desktop application., optimize the work to implement in Artificial environment deploy this model to AI on web application. and deploy this model to AI on web application.

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