BRAIN TUMOR DETECTION USING CONVOLUTIONAL NEURAL NETWORKS

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT, TIET, PATIALA

(101903030) ANMOL CHADHA
(101903746) HIMANSHU SINGH
(101903027) NITIN SHARMA
(101903535) ARYAN TIWARI

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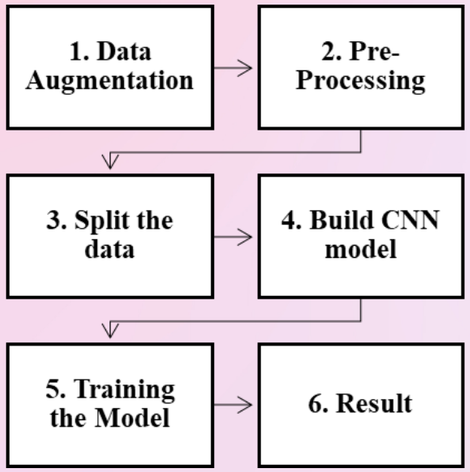
UNDER THE GUIDANCE OF: DR. HARKIRAN KAUR, ASSISTANT PROFESSOR

Introduction:

This study used a deep learning algorithm to identify different types of brain tumors from MRI scans. Compared to a human's ability to identify these tumors, the deep learning algorithm was found to be more accurate. The deep learning algorithm was also able to identify tumors that a human might miss.

Novelty of work:

1.)Used Relu activation layer
2.)AWS S3, autosaving groups, load balances for backend.
3.)Series of erosions and dilations used, removes noisy data.
4.) Cropped the border and dark part of image



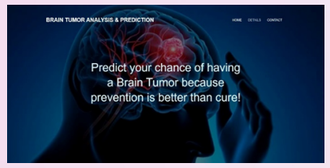
Methodology:

1.Data Augmentation: Handles imbalances and augments the data.
2.Pre-Processing: Cropping, resizing, normalization,.
3.Attaching backend AWS S3, Auto scaling groups, load balances, database.
4.Splitting the data: 70% trainings; 30% validations.
5.Trainings & Results (F1 score, Accuracy)

Result:

	Validation set	Test set
Accuracy	91%	89%
F1 score	0.91	0.88

These resutls are very good considering that the data is balanced.



Literature Survey:

Paper Title	Findings
Brain Tumour Detection Using ANN	The network performances were evaluated successfully tested and achieved best results with accuracy of 89%, specificity 87.9% and sensitivity 89%.
Brain Tumour Detection Using SVM Classifier	50 MRI images have been used to test this and a Kernel accuracy of 90% in each case has been achieved.
Brain Tumour Detection Using KNN	Noise can be effectively removed using morphological processes like erosion and dilation in combination with low pass and high pass filters. In order to get a satisfactory result from an MRI scan, a brain tumour will be classified using CNN and Deep Learning algorithm in the future.
A New Model for Brain Tumor Detection Using Ensemble Transfer Learning and Quantum Variational Classifier	The proposed approach based on convolutional and quantum neural network provides an accuracy of 89.2% on the Kaggle dataset

Architecture: