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Topic 4:-

Educational impact of advance Diagnostics A study
on Brain tumor Detection using CNN and U-Net

Introduction:-

In the contemporary landscape of brain tumor detection, the security and enhancement of algorithm plays a crucial role in improving accuracy across diverse medical scenarios. The research focuses on evaluating the effectiveness of CNN and U-Net models. The robust methodology of CNN is observed to outperform traditional methods, showcasing its superior effectiveness in the domain of medical examination. Previous approaches relying on manual imaging of the detection of brain tumors.

Related works:-

Brain tumor detection using GLCM with the help of its VM.

Published : February 2017.

An artificial neural network approach for brain tumor detection based on characteristics of GLCM texture.

Published : March 2013.

Learning texture features from GLCM for classification of brain tumor MRI image using random field
published : 2022.

Materials:-

Data:-

Specify the dataset used in the study include the dataset MRI image of the human brain to categorize whether the brain is affected or not affected by tumor.
No of groups :- 2

Sample size per sample :- 980 Total sample size :- 1960

Software and Tool:-

Data analysing and modelling were conducted using programming language the following libraries and framework were employed.

Python

framework

* Tensor flow : is used for the image recognition
* keras is used for the implementation of neural networking.

Methods :

The proposed system utilizes Gray Level Co-occurrence matrix and Convolution neural network for brain tumor detection. U-Net characterized the spatial relationship of pixel intensities of medical image prove. Variants texture information. meanwhile, CNN employs convolution layers to automatically learn an extract features from the input data.

In the proposed approach, spatial relationships are analyzed to capture subtle local details relevant to brain tumor patterns. The CNN models on the other hand utilize convolution layers for automatic feature extraction from medical image enhancing the system's ability to discern subtle tumor characteristics.

Result and Discussion:

The study demonstrates a significant enhancement in the accuracy of brain tumor detection with the implementation of U-Net with the accuracy of 91.5% and convolution neural network. The accuracy rate achieved by the combined GLCM and CNN model reaches 93.28% surpassing earlier methodologies by ~~impressive~~ margin of ~~22.8%~~ ~~91.5%~~. The improved

The effectiveness of the integrated approach in accuracy.

Identifying and characterizing brain lesions, showcasing its

potential for substantial control in both clinical and research settings.

In the proposed model of CNN-Basic Frg(4.1) and U-Net Frg(4.2)

Conclusion: we got the accuracy of 92.63 and U-Net of accuracy - 91.5

In summary the GLCM and CNN fusion for brain.

Tumor detection exceeded with a 93.28 accuracy, surpassing previous model of CNN by 8.28%. This kind of hybrid

analysis of automated features, bearing hope promises for enhanced clinical practices. The finding controls the ongoing advancement in medical image analysis, encouraging future

exploration for improved diagnostic precision.

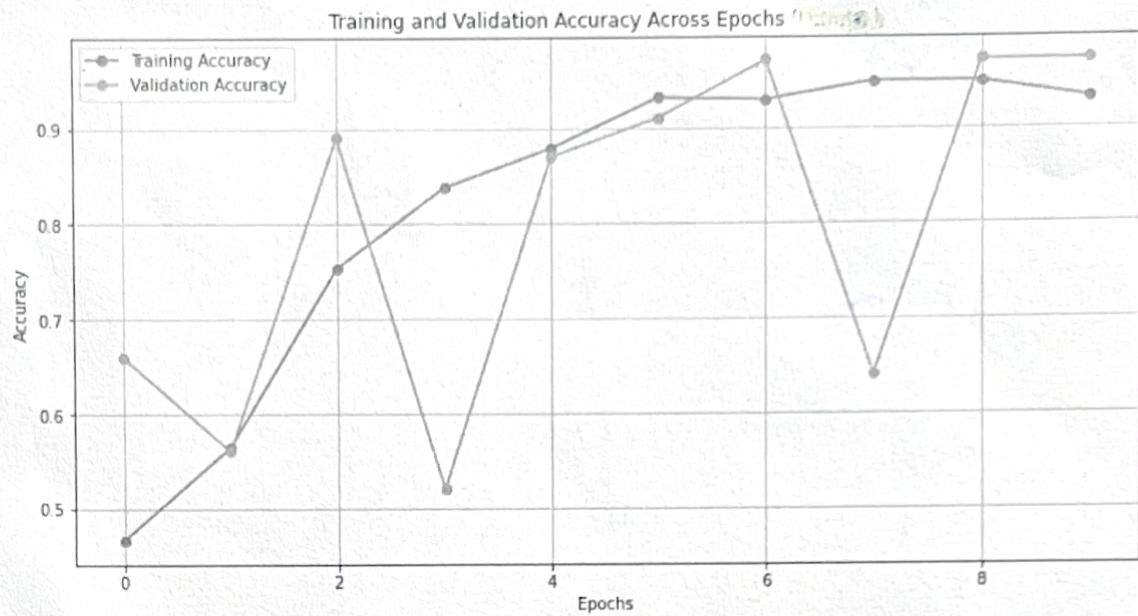


Fig: 4.1 shows the accuracy and loss of CNN

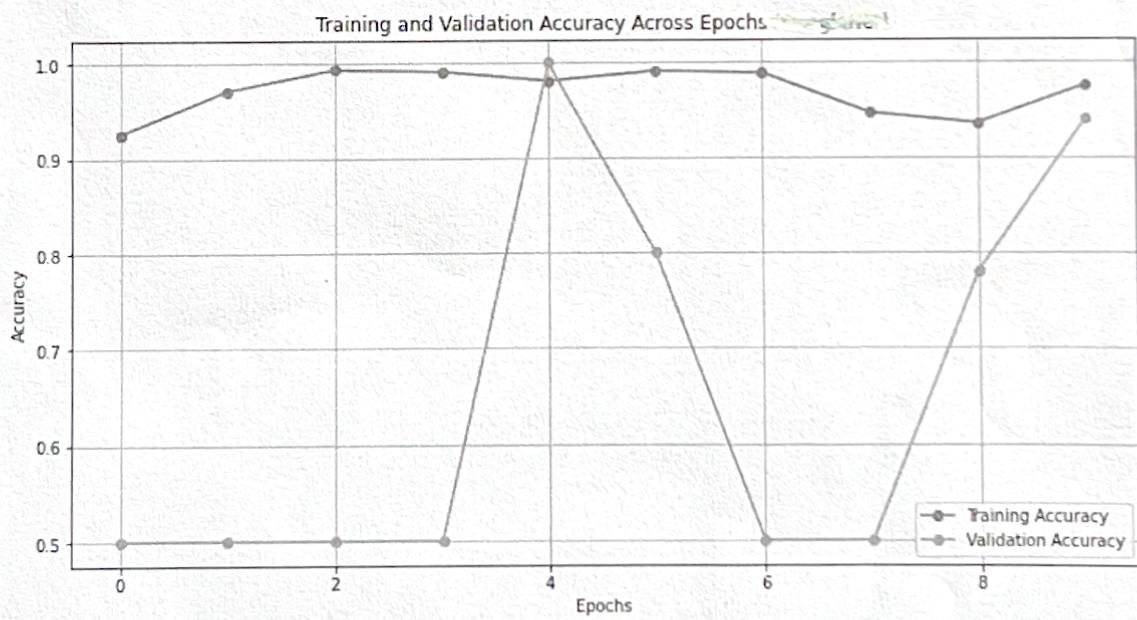


Fig: 4.2 shows the accuracy and loss of V-Net