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DECENTRALIZED BRAIN TUMOR DETECTION: LEVERAGING DEEP LEARNING AND BLOCK CHAIN FOR ENHANCED DIAGNOSIS.

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Abstract

Brain tumor can be classified into two types: benign and malignant. The brain tumors, are the most common and aggressive disease, leading to a very short life expectancy in their highest grade. Thus, treatment planning is a key stage to improve the quality of life of patients. Generally, various image techniques such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and ultrasound image are used to evaluate the tumor in a brain, lung, liver, breast, prostate…etc. Especially, in this work MRI images are used to diagnose tumor in the brain. However, the huge amount of data generated by MRI scan thwarts manual classification of tumor vs non tumor in a particular time. But it having some limitation (i.e) accurate quantitative measurements is provided for limited number of images. Hence trusted and automatic classification scheme are essential to prevent the death rate of human. The Block chain technology is the emerging field of science, which impart a major role in every application area of science, which includes the education, Banking, and health care also. In health care most of the health issues are occur due to because of their negligence of proper diagnosis by the doctor and ignorance the symptom by patients. The most common disease now a day is called as tumor. The brain tumor is usually having a symptom like increase in headache frequently, unexplained nausea or vomiting. Sometimes it may also have blurred vision, double vision and sometimes loss of peripheral visions are also. In this project we are going to diagnose the tumor using the Blockchain strategy.

Keywords: Security, Reliability, Data Integrity, Block chain, health care, brain tumor

I. INTRODUCTION

The big problem of the tumors is life threatening. Essential brain tumors originate within the brain. In the optional sort of brain tumor, the tumor ventures inside the brain effects from different pieces concerning the body. Imaging tumors besides further precision assumes a critical job in the conclusion of tumors. It includes high-goals systems like MRI, CT, PET, and so forth. MRI is a significant method for examining the body's instinctive arrangements [8]. It is broadly utilized because it provides better quality images regarding the brain and malignant tissues contrasted and different therapeutic imaging

procedures, for example, X Beam or Figured Tomography (CT). almost like a nonabrasive procedure tomography is considerably used [4]. the elemental rule behind MRI is to provide pictures from MRI checks utilizing a solid magnetic discipline furthermore radio entrances of the body that assists in watching the expansion regularities of the body. Image Segmentation signifies a procedure of partitioning a picture within its elector parts or things among specific image for associate example created from pixels, pixels throughout the venue are comparable as indicated by some homogeneity criteria, for example, shading, power or surface so as to search out and acknowledge limits in an image [6]. within the course of the previous few decades, tons of endeavors are concentrating on the segmentation procedure. There are such vast numbers of image segmentation studies that have been diode [3, 9]; notwithstanding, there aren't many that have exhibited however analysts will assess one system toward the opposite on a neighborhood of their segmentation. These provide that image segmentation stands yet a hot zone of analysis is as yet a tough mission. This signifies the segmentation from brain tissue as well as tumors of two-dimensional MRI. The self loader ways need the association of the consumer for 3 principle purposes; statement, intercession or input reaction and analysis thus on phase the image [7]. 1 1 The self loader brain tumor segmentation procedures signify little tedious than normal strategies additionally ready to get effective outcomes, anyway still inclined to intra and between image/client inconstancy challenges. Accordingly, ebb and flow brain tumor segmentation inquire regarding is for the foremost half cantered around fully programmed strategies that were expected to figure notwithstanding image variability [1], [4], [5], [10], and [11]. Neural networks adopt an alternate strategy to critical thinking than that of conventional computers. Conventional computers utilize an algorithmic methodology, for example, the computer adheres to a lot of directions so as to tackle an issue. Except if the particular advances that the computer needs to pursue are realized the computer can't take care of the issue. That confines the critical thinking capacity of conventional computers to issues that need to comprehend and realize how to understand. Neural networks process data similar to the human brain. The system is made up of enormous number of profoundly interconnected preparing elements (neurons) working in parallel to take care of a particular issue. Neural networks learn by model. They can't be customized to play out a particular undertaking. The models must be chosen cautiously generally valuable time is squandered or the system may work erroneously. The burden is that in light of the fact that the system discovers how to take care of the issue without anyone else, its activity can be eccentric. We are going to detect tumor using CT scan images of brain using CNN. It shows the result in two different ways tumor or non-tumor.

II. LITTRETURE SURVEY

In this section, we present a review of related works on detection of brain tumor applying deep learning procedures. The variety of automatic ways of segmentation of CNN -dependent brain tumors was recently presented. Along these lines, the 4D computer file is adequately served by CNN. While handling high dimensions can additional easily speak to the 3D plan of organic structures, it also builds up the pile of network preparation. 2 distinctive networks are structured. The start was a four-level CNN that contained the information coverage containing fifteen 3D channels with fifty-three abstraction measures, with ANN additional fourth measurement representing the associated MRI methodology, which resulted in a channel state of five x 5 x 5 x 4. Two of the channels with hidden layers have an extra 53 spatial measurements additionally to a measurement related to the quantity of channels within the previous layer. In particular, the amount of channels was a deep level 25. The end coverage includes the Soft max course 6 courses ordered during any tissue kind in order to get the

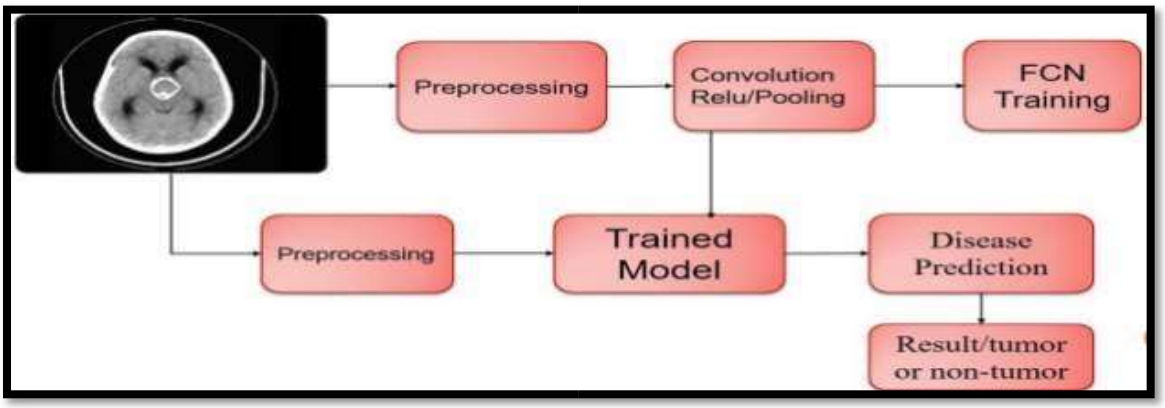
understanding of the yield as probabilities. The following network is much indistinguishable, with the exception of AN additional hidden layer with forty channels of size 53. Associated parts are used for preprocessing the results. In [13], Zikic et al. developed an understanding strategy to modify the 4D knowledge with the aim that Paradigm 2D-CNN styles will be used to increase the load of the high dimensional CNN structure whereas increasing computational productivity. The reconnaissance is completed by everchanging all 4- modalities of the 3D input of the size (d1 x d2 x d3 x 4) to 4. d3-channel of second patches of size (d1 x d2 x 4d3). With this strategy, input patches of size 19x19x4 in an exceedingly 2D-CNN with 2 convolutional layers with sixty-four channels with a size of 5 x five x 4 and three x 3 x 4 are nourished individually, isolated by a most pooling layer, followed of a fully associated (FC) layer and a soft max layer. In [14], another similar approach described as in [16]. In addition to this novel composition method, a production is also carried out in two stages. Keep away from uneven characters within the class. In the main phase Fell CNN is ready with an adequate acquisition of teams, including the following phase. CNN was retraining with increasing delegate dissemination of the first metaphors. In addition, the Max out 1 5 nonlinearities were used and the strategy the associated phase was updated as post handling action. High Minxes Cubes rates of 88% on the entire growth area, 79% throughout Center Tumor District and 73% for the dynamic tumor venue are taken into account. In [15] a limited design for CNN is suggested throughout the approach. Instead of using CNNs to characterize focal voxels with respect to data image items within brain tissue classes, initial fixings of names are extracted from sand exactitude patterns and then bundled by k-implied algorithmic rule in N assemblies to border an N size marker fix40a4lexicon. Then a second CNN is used to characterize multi-level knowledge model pieces at intervals a unit of these assemblies. In relation to this segmentation implementation of the schema, Whelps cubes rates of 83%, 75% and 77% for of the entire growth, the central tumor and the dynamic tumor areas are considered separately. In [18], Rao et al. In addition, several level fixes for each element from four different CNN individual search info bits were created from each different MRT methodology image. The fixtures from the last rock bottom of CNNs were successfully connected and used as highlight maps to create an RF classifier% was given in this way. In [20] another innovative approach that was carried out was carried out in two CNN architectures. By extracting smaller patches and larger calculable fixes at the same time, a Fell CNN that processes near intricacies of the brain tomography
is found in addition to the larger setting of the brain tissue in an exceedingly similar space of the image, patches are estimated and 33 x thirty three elements are made by each distinctive MRI Method for the nearby path separated, and patches with a size of 65 x 65 are extracted for the worldwide path to rearrange the marking of the focal pixel CNN to yield patches of size 33 x 33 x 5. Those yield patches were later linked with the neighborhood patches of size 33x33x4 and nourished as a data to a two-track CNN with convolutional stages contain 7 x 7 estimated channels in a single way and 13 x 13 measured channels in the previous one. Consequently, making fell two-pathway CNN architecture. A few altered architectures of this fell CNN process was likewise planned.

III. PROBLEM DEFINATION

Brain tumor is introduced as life threatening diseases and hence its need to detect these diseases fast and accurate. This can be work out by the execution of automated tumor detection techniques on medical images. Medical Image Processing is a complex field now a day Brain tumors can be detected manually by experts from the CT scan images. Pre-processing is necessary to enhance the problem from input i.e. CT scan images.

IV. PROPOSED METHODOLOGY

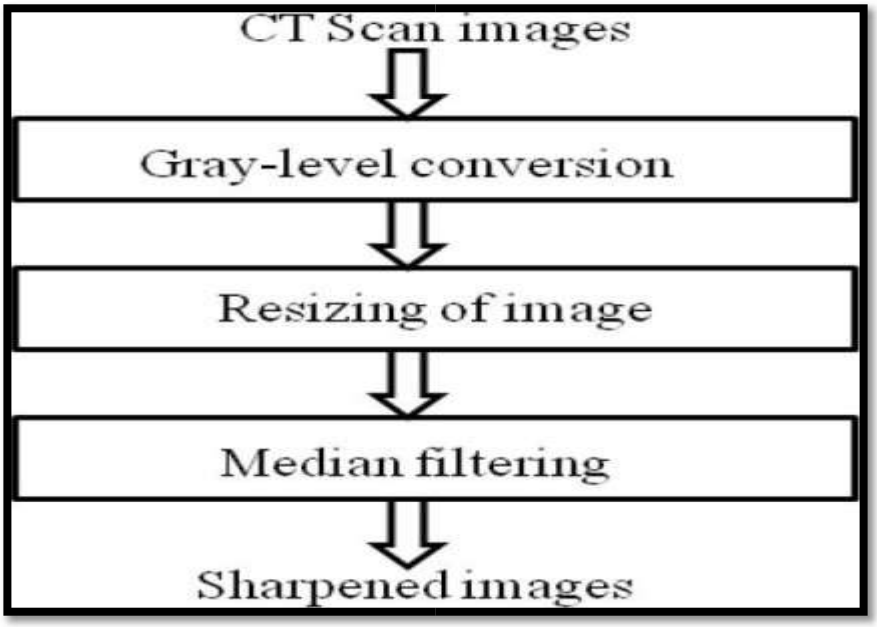
In this study, to improve the performance and reduce the complexity involves in the CT scan image. Brain tumors can be detected manually by experts from the CT scan images we apply Preprocessing on that and show the accurate result. CT scan Image: The term “computed tomography”, or CT, refers to a computerized x-ray imaging procedure in which a narrow beam of x-rays is aimed at a patient and quickly rotated around the body, producing signals that are processed by the machine’s computer to generate cross-sectional images or “slices” of the body. These slices are called tomographic images and contain more detailed information than conventional x-rays. Once a number of successive slices are collected by the machine’s computer, they can be digitally “stacked” together to form a three dimensional image of the patient that allows for easier identification and location of basic structures as well as possible tumors or abnormalities. CT scan Image Preprocessing Segmentation Tumor area measurement 2 6 2. Preprocessing Successful Segmentation of the image is followed by the post-processing of the image. Pre- Processing of the image involves steps to judge the size of the tumor and its type. Pre-processing may also involve various optimization techniques to further improve the result. Overall Architecture Design We propose CT Scan image quality enhancement and its application using CNN Algorithm. For developing dependable and ordinary techniques to identify the brain tumor, extract the quality of it for medicinal determination, visualization, and the presence forecast. IT is Robust and scalable CNN based image segmentation and features extraction by considering different types of the dataset with minimum computation efforts. The use of appropriate feature extraction and reduction models may help to reduce the detection time and improving the accuracy.



1.CT scan

CT scan mostly depends on computer technology to generate or display digital images of the internal organs of the human body which helps the doctors to visualize the inner portions of the body. A CT27 scan combines sophisticated x-ray and computer technology. CT can show a combination of soft tissue, bone, and blood vessels. CT images can determine some types of tumors, as well as help detect swelling,bleeding,
8and bone and tissue calcification. Usually, iodine
is the contrast agent used during a CT scan.The CT scan image of brain tumor is an input for this proposed algorithm. The CT scan image is a blur image. The noise is present in this image. Noise disturbances may cause because of electronic imaging sensors, sensor temperature, insufficient Light levels, film granularity, and channel noise. So preprocessing is essential for such images to remove blurriness from it and make it sharper. **2.Preprocessing**

. Preprocessing Successful Segmentation of the image is followed by the postprocessing of the image. Pre- Processing of the image involves steps to judge the size of the tumor and its type. Pre-processing may also involve various optimization techniques to further improve the result.



3. Tumors Area calculation

Area of an image is calculated by knowing the vertical and horizontal resolution of an image. It depends on the three key factors:

1. Total no of pixel in region of interest Preprocessing System Detection Tumor/Non tumor Image Classification
2. Horizontal resolution
3. Vertical resolution

Area of tumor = vertical resolution * horizontal resolution* total no of pixels in infected area.

4.Segmentation technique is to separate out tumor region from CT scan image. Using segmentation, it is possible to identify objects, boundaries, location in an image. There are many applications of segmentation in medical field like identify the diseases in CT scan. The segmentation is done by Region growing method and edge detection method.

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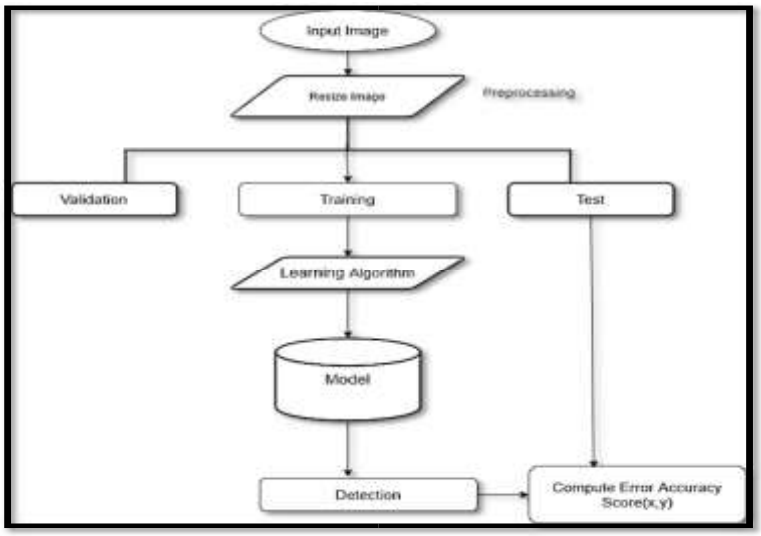

FLOWCHART SYSTEMS

V. ALGORITHM DETAILS

• CNN (Convolutional Neural Network) is a deep learning algorithm that has shown great success in image recognition tasks, including medical image analysis. In the context of Brain tumor detection using blockchain technology, CNNs can be used to analyze medical imaging results and identify potential brain tumors

• Here's how CNN algorithm can be used in Brain tumor detection using blockchain technology:

• Preprocessing the medical imaging results: The medical imaging results, such as MRI or CT scans, are preprocessed to extract the relevant features of the image. This includes resizing the images, normalizing the pixel values, and applying various image enhancement techniques to improve the image quality.

• Training the CNN model: Once the medical imaging results are preprocessed, they are used to train a CNN model. This involves feeding the preprocessed images into the CNN model, along with their corresponding labels (i.e. whether they contain a brain tumor or not). The CNN model then learns to recognize the patterns and features that distinguish brain tumors from normal brain tissue.

• Testing the CNN model: After the CNN model is trained, it is tested on a separate set of medical imaging results to evaluate its performance. This involves feeding the preprocessed images into the CNN model and comparing its predictions to the true labels of the images. The performance of the CNN model is evaluated using various metrics such as accuracy, sensitivity, and specificity

• Integrating the CNN model with blockchain technology: Once the CNN model is developed and tested, it can be integrated with blockchain technology to record and verify the medical imaging results on a decentralized network. The medical imaging results can be processed by the CNN model to identify any potential brain tumors and the results can be recorded on the blockchain network. The blockchain network can be used to store the verified medical imaging results securely and provide access to authorized medical professionals to view and interpret the results.

• Overall, CNN algorithm can be a valuable tool in Brain tumor detection using blockchain technology, as it can help identify potential brain tumors with high accuracy and efficiency, and integrate the results securely on a decentralized Network.

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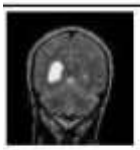
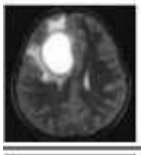
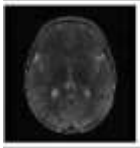
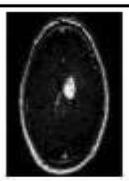
VI. RESULT

The Block chain technology is the emerging field of science, which impart a major role in every application area of science, which includes the education, Banking, and health care also. In health care most of the health issues are occur due to because of their negligence of proper diagnosis by the doctor and ignorance the symptom by patients. The most common disease now a day is called as tumor . The brain tumor is usually having a symptom like increase in headache frequently, unexplained nausea or vomiting. Sometimes it may also have blurred vision, double vision and sometimes loss of peripheral visions are also. In this project we are going to diagnose the tumor using the Blockchain strategy. For clinical feature analysis, improvement is necessary for extraction of deep layer features. For feature extraction various kinds of image enhancement methods like arithmetic operation, histogram equalization, and adaptive histogram equalization have been applied. The detection of diabetes using Iridology includes image acquisition, pre-processing, segmentation, Iris region, Normalization, Feature extraction, Classification. The results shown in fig are up to region of interest extraction for particular diagnosis using iridochart.

Fig. 4.3: Results in Inference Tab By analysis of results and processing time, we can conclude that processing speed and results depend on 1. Pixel gradient 2. Pixel size 3. Size of image and 4. Quality of image We have performed time analysis for different images and results clearly shows the dependency of time on the abovementioned parameters. Table 4.2 shows the processing time for different MRI Images

VII. SCREEN SHOTS

	152.1 milliseconds	Tumor Found
	168.9 milliseconds	Tumor Found
	157.1 milliseconds	Tumor Found
	733.5 milliseconds	Tumor Not Found

MRI Image in .jpg Format	Processing Time	Remarks
	175.3 milliseconds	Tumor Found
	565.5 milliseconds	Tumor Found
	202.3 milliseconds	Tumor Found

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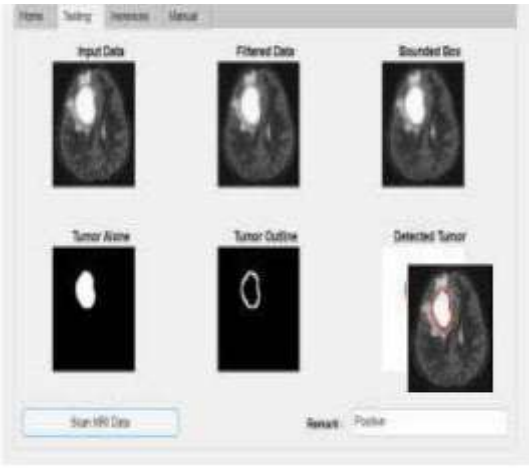

VIII. DATASET

The Database was gathered from Kaggle, named 'Brain MRI Images for brain tumor Detection' By Navoneel Chakrabarty.[6] The dataset comprises 253 Brain MRI Images in the folders yes and no. The folder yes contains 155 timorous brain MRI images, whereas the folder no has 98 non-timorous brain MRI images.

Experiments were conducted on 2065 photos, 1085 of which had malignancies and 980 of which did not. The dataset is further split as: 70% as training, 10% as validation, and 20% as testing; each experiment was conducted for up to 50 epochs with early stopping to control overfitting. On the 32nd epoch, the model had a test accuracy of 89% and a test loss of 0.3033, learning rate is0.001.

IX. TYPE OF TESTING

Type Of Testing Used : Along with the type of testing also mention the approach to be followed for the testing, thatis, Manual Testing or Automated Testing The doctor identify the disease earlier and improve patient outcomes drastically.Today,advanced Medical Imaging offers numer ous benefits toboth the health care provider sand the patients.CNN is the best approach for medical image processing to find accurateand quick results

Following are advantages of our system :

1.BetterDiagnosis
2.ComplicatedSurgeries
3.AffordableHealthCareCosts
4.Safe&effective
5.File-sharingEcosystem&DataPrivacy
6.HighAccuracy.
7. Lessefficient.

Applications

1.Leaf Disease Detection.
2.Medical image process

X. CONCLUSION :

The prediction was successful compared to predicting test data from the same database used to train variants. However, the predictor remains poor in finding a statement associated with contempt. This may be due to a combination of lack of training and test images that clearly show contempt, poor labeling of previous data training, and internal difficulties in identifying contempt. The class divider also fails to predict the sensitivity of the test data to not only one of the seven key expressions, as they are not trained in other expressions. Future work should include improving the strength of class dividers by adding more training images from different data sets, investigating more accurate detection methods that still maintain mathematical performance, and considering classification of friendly and complex expressions

XI. FUTURE SCOPE

The process can be extended to a 3D image. The proper anatomical position may be detected. Fixed thresholds were used. Machine Learning may be implemented to train the system dynamically change the thresholds. A novel algorithm for the segmentation and classification of brain tumors is described in this project work. Results and analysis show that the proposed approach is a valuable diagnosing technique for physicians to detect the brain tumors. But, in the final segmentation, a few other tissues also segmented in addition to tumors. Therefore, to improve the accuracy in the segmentation, it is necessary to include additional knowledge for discarding other tissues. In future work, it would be interesting to include additional feature information. Besides the energy, correlation, contrast and homogeneity add more information to the feature extraction to make the system more sensitive; information from the textures or location It will be interesting to continue developing more adaptive models for other types of brain tumors following the same line of work presented here. Another future line would be the detection of small malignant brain tumors. It should be clear that many factors influence the appearance of tumors on images, and although there are some common features of malignancies, there is also a great deal of variation that depends on the tissue and the tumor type. Characteristic features are more likely to be found in large tumors. Small tumors may not have many of the features of malignancy and may even manifest themselves only by secondary effects such as architectural distortion.

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He would not be able to work without me Physical Tired Illness Headaches Depression problem Misfortune Islam et al. Health Inf Sci Syst (2018).
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