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DEEP LEARNING MODEL-BASED OPTIMAL FEATURE SELECTION FOR MEDICAL IMAGE CLASSIFICATION IN THE INTERNET OF MEDICAL THINGS

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ABSTRACT:

The Internet of Medical Things (IoMT) is a collection of medical devices and related products. An application that connects health IT systems through an Internet computer network and mood. In terms of diagnosis, medical condition classification plays an important role in the prediction and early diagnosis of serious diseases. Death medical imaging is an important part of a patient's medical record and can be used internally for management, control and treatment of diseases. However, classifying images on a computer is a difficult task analysis. In this research paper, we introduce a more efficient and deep learning classifier (DL) for lung cancer classification, brain imaging and Alzheimer's disease. Researchers think Set up Preprocessing, feature selection and classification. The main goal of writing this is to get the best results. A feature selection model for good health image classification. DL performance will improve. In the classifications, a kernel search (OCS) algorithm is considered. Selection of OCS algorithm. The best features of the image are pre-processing, here select the multi-textured, grainy features analysis. Finally, the best features improve classification results and improve accuracy, specificity and sensitivity of medical imaging analysis. The expected results have been achieved by MATLAB and comparison with feature selection models and other classification methods. Here, the proposed model achieves high performance in terms of accuracy, sensitivity and specificity For the set of images requested, it was 95.22%, 86.45% and 100%.

INTRODUCTION:

Recently, medical information has become a hot topic Subjective research on the convergence of information and communication technology Human health service needs. Many studies work have been carried out in the following areas: Investigations Medical imaging - for diagnostic purposes as a clinical study [1]. The photo was taken Through extensive research and computer-aided analysis imaging systems, such as magnetic resonance imaging (MRI), computer tomography (CT) scans, and Ultrasound B scan. Get better classification results Exposure, imaging and discrimination. The strength of the features taken is important Image classification problems. This is machine learning. This section is relevant because it is broad in scope applications in data mining, predictive modeling and other fields Saving media, etc. Medical

imaging database for imaging. They are classified and used for teaching purposes. Many includes images of varying quality, as shown in different situations, and correct interpretation. In medical diagnosis, it is the most important thing to understand important risk factors associated with the diagnosis. Here basic features of traditional medical imaging. There are many different algorithms, such as color, features of texture and construction. It's the best part of the situation are conducted to improve classification performance or reverse model, especially in dealing with large-scale spaces through optimization [2]. Here optimized display of a subset of defined features new problem. Now, a new request. The algorithm based on surgery knowledge is described here. If the delay in the subtraction algorithm is too long Features, handpicking the best features to get Evaluation. Therefore, the optimal feature selection is defined as Create this software process. A lot of research has been done Image classification was performed for cancer. The complexity of the computer is enormous. This technology requires image structure. Most of the classification process Find the right connections between members Functions [3] and properties of things. Also, the correct identification of these basic functions is very critical [4]. Proposed work, Deep Neural Networks Network (DNN) is widely used in real world Classification methods, such as having information, Error detection, health analysis, etc., [5]. A small place engineering uses a lot of computers. Be sure to point out the current situation differently Get details using [6] depth settings A limited number of layers with direct and non-linear modulation capabilities [7]. Some of the advantages of deep learning models are reducing the need for character building, and it is considered as one of the most time-saving features of Machine learning techniques. If there is a large amount of data and It is descriptive, easy to understand the spoken language, solving problems and increasing productivity [8]. By using deep learning techniques, this can be avoided Frequently Asked Questions: Too much food period. Image classification is an important part and parcel Image classification is a big challenge in expert medical knowledge. This is the main topic of this article Just focus on having medical imaging analysis and classification method [9]. The author presents the best features set up model learning, by combining preprocessing with features selection and classification. This is the main topic of this article. The best part selection models are well exported Medical image classification. To achieve this goal, a combination of gray-level matrices (GLCM) and long-run matrices (GLLRM) is used together. We recommend using texture features such as GLCM and GLRLM. Some of the features are removed from the drug before processing picture. In the past, the downloaded features were fed into the classification process. However, in the proposed method, it did not continue with the classification process because of that it takes more computer time to do it. Because of that, most of the time select the most important features using rejection techniques Crow Search Optimization Method or OCS. Here Application of OCS algorithm in GLCM selection. The GLRLM feature represents the latest in this work. Finally, Deep learning techniques are used to classify the information that is sent Medical imaging whether serious or mild. Also, The consistent performance of the proposed model. It has been proven to fight brain, lung and Alzheimer's disease Identification and classification process.

LITERATURE REVIEW

In 2018, MaayanFrid-Adar et al. [10] created the engineered medical images with the help of newly proposed deep learning Generative Adversarial Networks (GANs). The classic data expansion was performed by training the Convolutional Neural Network (CNN) whereas the synthetic data expansion and performance comparison were done. The results obtained were 78.6% sensitivity and 88.4% specificity for the classification performance utilizing classic data expansion. By adding the synthetic data expansion, the results got improved by 85.7% sensitivity and 92.4% specificity. A Computer Aided Diagnosis (CAD) was introduced in the research work by V. Sharma and

K.C. Juglan [11] for the categorization of liver ultrasound image. The image features were separated using seven particular surface models to describe the surface of Region of Interest (ROI). The Mutual Information (MI) feature selection strategy was utilized after it was chosen by its exceptional segregation highlights. The proposed CAD framework was able to yield 95.55% precision and affectability of 97.77% with 20 best features chosen by the MI including the determination method. Li Zhang et al. [12] conducted a research study in which the Firefly Algorithm (FA) was adjusted in selecting the components of characterization as well as regression techniques to support the fundamental forms with the help of data-based learning models. To assess the effectiveness of the proposed FA method, an aggregate of 29 characterizations and 11 relapse benchmark informational indexes were utilized. The proposed FA adjustment offered a proficient strategy to perceive ideal element subsets in classification as well as regression models for supporting the information-based basic leadership forms. The CT output of lung images was examined with the help of Optimal Deep Neural Network (ODNN) along with Linear Discriminate Analysis (LDA) by Lakshmana prabu S.K et al. [13]. The profoundly highlighted sections were removed from CT lung pictures after which the dimensionality of the feature was reduced using LDR to categorize lung nodules as two types: malignant or benign. In order to recognize the lung malignant growth arrangement, ODNN was connected to CT scans and was upgraded using Modified Gravitational Search Algorithm (MGSA). To enhance the analysis of Parkinson's ailment, the advanced variant of Crow Search Algorithm was introduced (OCSA) by Deepak Gupta et al. [14]. The outcomes were against the primary Chaotic Crow Search Algorithm (CCSA) whereas the execution of OCSA was estimated for minimum standard datasets. The proposed nature-motivated calculation found an ideal subset of features from the test result and expanding the exactness and diminishing various features were chosen for further study. In the research conducted by Justin Ker et al.[15], in the instance of medical data possessing bigger hierarchal connections in the information, the upside of machine learning can be found through algorithms without relentless hand-making features. Lately, the astounding accomplishment of machine learning calculations in image recognition intersects with a period of significantly expanded usage of electronic medical records and image diagnosis.

EXISTING METHOD:

The explanatory power of ANN is not satisfactory whereas optimization of the network can be challenging, especially in avoiding the overtraining of data. In case of an SVM classifier, it leads to omissions and misclassification when identifying small and irregularised cancers. Tumor diagnosis is a basic criteria that needs to be met. In imaging test, finding the right tumor part is a mind blowing test. In addition, the image mining systems are present only to find the exact tumor cells by following numerous techniques. Existing feature determination models display challenges i.e., optimization [13, 14] and dimension reduction joining features from various information models [17]. Further, the potential challenges of performing feature selection in little sample estimate situations need to be exhibited. By analyzing the existing papers, it was inferred that several researchers took efforts to develop methodologies so as to overcome these challenges. Yet, some specific problems related to optimization algorithm still exist such as high computational time, misdetection because of small size, etc., The motivation to overcome these issues paved the way to propose a new method.

DISADVANTAGES:

- Network optimization is a complex process.
- Suffers with overtraining problems.
- Leads to misclassification and omissions when identifying small and irregularised cancers.

- In existing systems Tumour diagnosis is a challenging criterion.
- Existing feature determination models display challenges in optimization and dimension reduction joining features from various information models.
- Unable to mitigate the image classification issues properly.

PROPOSED METHOD:

In the domain of medical image classification, diagnosing the individual's disease from medical dataset is a promising computation. The current research work considered four datasets for image classification analysis and the main aim is to achieve maximum accuracy in disease prediction. The three datasets considered were brain, lung, breast cancer and Alzheimer's disease. From these datasets, the stages of each patient's image were classified as Benign and Malignant at an early stage by the proposed classification (DL) technique. This medical image classification consists of three stages such as pre-processing, feature selection, and classification.

♣ Preprocessing: The purpose of image preprocessing is to get a better quality of images. Here, the histogram equalization is used to enhance the input image quality.

♣ Optimal Feature Selection (OCS): One of the significant image processing steps is feature selection; this makes the image classification, a simple process.

♣ Classification: According to the selected best features, it classifies medical images into benign and malignant.

This section consists of Histogram Equalization (HE) which is used to enhance the image quality. This is performed by leveling the image pixel gray-levels in order to reorganize them constantly in the spatial space.

Feature selection is a dimensionality reduction method used in datasets; it eliminates irrelevant or redundant features from the pre-processed image.

The feature selection strategy implies less data transmission. Usually, several feature extraction models are applied in data mining process. In the proposed study, two techniques were used to extract the desired features i.e., GLCM and GLRLM.

It is a measurable technique of examining the texture that considered spatial correlation of pixels in GLCM or else it is also termed as gray-level spatial dependence matrix.

Gray-level Co-occurrence Matrix (GLCM): It is a measurable technique of examining the texture that considered spatial correlation of pixels in GLCM or else it is also termed as gray-level spatial dependence matrix.

ADVANTAGES OF THE PROPOSED SYSTEM:

1.) Network optimization is improved.
2.) Overtraining problems are Simplified.
3.) Omissions and misclassifications when identifying small and irregularised cancers are reduced.
4.) In proposed systems Tumor diagnosis challenges are overcome.
5.) Effective in optimization and dimension reduction from various information models.
6.) Can mitigate the image classification issues properly.
7.) The impact of noise in image classification is reduced.
8.) Proposed methods are effective in image classification.

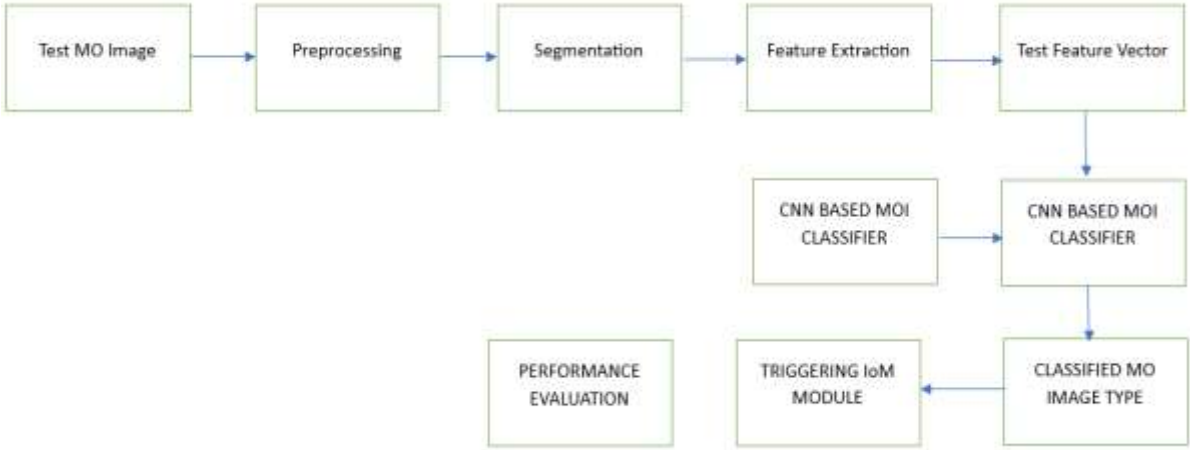

Fig 1: Block diagram

RESULTS:

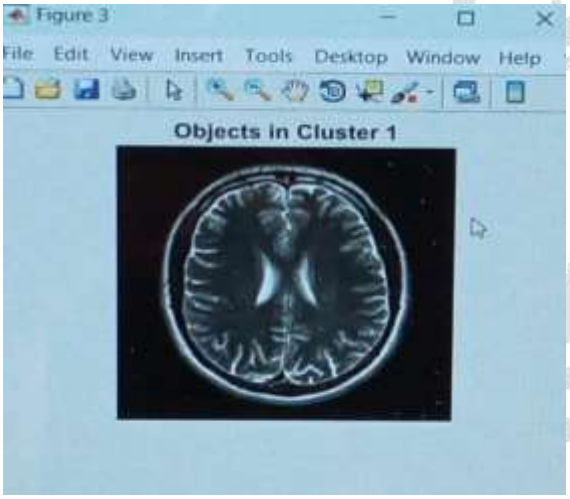

Fig 2: Input image

Fig 3: Output

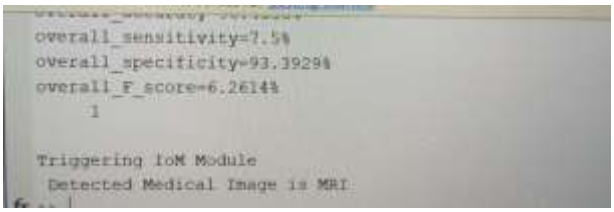

Fig 4: Output parameter

CONCLUSION

A novel classification method was proposed to classify the medical images by choosing the best features from the images. Thus, a novel system of clinical image classification was presented on the basis of soft set to accomplish better execution regarding accuracy, precision and computational speed. The performance measures of the proposed DL achieved 95.22%accuracy, 86.45% sensitivity and 100%specificity in DL classifier with optimal features (OCSA) model. The present strategies can be modified by including other measurable features so as to get expanded unwavering quality in the classification of difficult medical images. The technique presented here incurred maximum cost. Though it yielded the optimal result, the precision must be improved under the application of eliminating massive features and prolonging the training dataset. In future investigations, the segmentation systems and some automatic classification techniques should be used to identify the tumor part in medical images and furthermore feature reduction strategy is likewise to be considered.

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