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DESGIN OF DEEP LEARNING TECHNIQUES FOR DETECTING PARKINSONS'S DISEASE USING VARIOUS COMBINED FEATURE

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Abstract: Diagnosis of Parkinson's disease (PD) is commonly based on medical observations and assessment of clinical signs, including the characterization of a variety of motor symptoms. However, traditional diagnostic approaches may suffer from subjectivity as they rely on the evaluation of movements that are sometimes subtle to human eyes and therefore difficult to classify, leading to possible misclassification. In the meantime, early non_motor symptoms of PD may be mild and can be caused by many other conditions. Therefore, these symptoms are often overlooked, making diagnosis of PD at an early stage challenging. To address these difficulties and to refine the diagnosis and assessment procedures of PD, machine learning methods have been implemented for the classification of PD and healthy controls or patients with similar clinical presentations (e.g., movement disorders or other Parkinsonian syndromes). To provide a comprehensive overview of data modalities and machine learning methods that have been used in the diagnosis and differential diagnosis of PD. These studies demonstrate a high potential for adaptation of machine learning methods and novel biomarkers in clinical decision making, leading to increasingly systematic,informed diagonosis of PD.

1.INTRODUCTION

Computer aided diagnosis systems based on brain imaging are an important tool to assist in the diagnosis of Parkinson's disease, whose ultimate goal is the detection by automatic recognizing of patterns that characterize the disease. In recent times Neural Networks (NN) have proved to be amazingly useful for that task. The drawback, however, is that 3D brain images contain a huge amount of information that leads to complex NN architectures. When these architectures become too complex, classification performances often degrades because the limitations of the training algorithm and over fitting. Thus, this paper proposes the use of is surfaces as a way to reduce such amount of data while keeping the most relevant information. These is surfaces are then used to implement a classification system which uses two of the most well-known NN architectures, LeNet and AlexNet, to classify DaTScan images with an average accuracy of 95.1% and AUC = 97%, obtaining comparable (slightly better) values to those obtained for most of the recently proposed systems. It can be concluded therefore that the computation of is surfaces reduces the complexity of the inputs significantly, resulting in high classification accuracies with reduced computational burden

1.2 OBJECTIVE

To date there is no cure for PD but early diagnosis allows limiting the rate of progression by applying effective management and may help to develop new therapeutic methods. 2Diagnosis of PD is usually based on clinical examinations that analyze different motor symptoms such as tremor, bradykinesia, rigidity and postural instability (Eckert et al., 2007), along with the response to levadopa. Levadopa is a chemical product that converts to dopamine so that PD is confirmed whether symptoms reduce after levadopa is administered during a period of time. However, PD can be confused with other parkinsonian syndromes and in the early stages of the disease symptoms are still mild and the response to levadopa are not so clear, which may result in difficult diagnosis. As a consequence, functional neuroimaging are then usually used to improve the early diagnosis of the disease.

1.3 SCOPE

The Deep Learning Neural Networksdefines the state of art for widespread applications such as image recognition problem, segmentation and retrieval. This new paradigm has produced fantastic results in recent years in analyzing the content of images, speech and videos. The current state-of-the-art Neural Networks achieve accuracies that surpass

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humanlevel performance. Our aim of this work is to adapt DNN network to develop trained predictive models that will efficiently classify Parkinson's Disease affected neural images from health normal neural images.It uses supervised learning algorithm.

2.ANALYSIS

2.1 SYSTEM ANALYSIS

2.1.1PROBLEM STATEMENT

• Can't able to assist in Diseases detection at its earlier stage

• Increases the time of the radiologist in evaluation.

• It decreases the diagnosis accuracy

• Hard to implement in Neural network systems.

2.1.2 EXISTING SYSTEM:

• The objective of this paper is to provide preliminary evidence that artificial intelligence systems may allow one to discriminate PD patients from (HV) further and determine different features of the disease within a cohort of PD subjects.

• The recently introduced Neural Network Construction (NNC) technique was used here to classify data collected by a mobile application (iMotor, Apptomics Inc., Wellesley, MA) into two categories: PD for patients and HV.

• The method was tested on a series of data previously collected, and the results were compared against more traditional techniques for neural network training. Additional 12artificial intelligence-based studies in larger cohorts of patients are warranted.

2.1.3 PROPOSED SYSTEM:

• Nowadays, an important research effort in healthcare biometrics is finding accurate biomarkers that allow developing medical-decision support tools. These tools help to detect and supervise illnesses like Parkinson's disease (PD).

• This paper contributes to this effort by analyzing a convolution neural network for PD detection from drawing movements. This CNN includes two parts: feature extraction (convolution layers) and classification (fully connected layers).

• Magnetic Resonance (MR) Imaging is able to capture the structural changes in the brain due to dopamine deficiency in Parkinson's disease subjects. In this work, an attempt has been made to classify the MR images of healthy control and Parkinson's disease subjects using deep learning neural network.

• The Convolutional Neural Network architecture AlexNet is used to refine the diagnosis of Parkinson's disease. The MR images are trained by the transfer learned network and tested to give the accuracy measures. 13

• Deep learning models are able to help the clinicians in the diagnosis of Parkinson's disease and yield an objective and better patient group classification in the near future.

3.SYSTEM DESIGN

Systems design is the process of defining the architecture, components, modules, interfaces and data for a system to satisfy specified requirements. System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and

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well running system.

4.MODULES

The proposed system has four modules which clearly depicts the flow of system. The modules are listed below,

- Image acquisition
- Image Preprocessing
- Feature extraction using feature matching
- Activation function of neural networks

4.1.IMAGE ACQUISITION:

In image processing ,image acquisition is defined as the action of retrieving image from source. The draw image of the neurons of the Parkinson patients will be captured and stored. Image acquisition is the first and most important step to capture the image. Hardware image carries a very important role to acquire a image with sufficient contrast and sharp focusing. Each individual image for stored and further analysing can be carried on thereafter with the given data sets.

4.2.IMAGE PREPROCESSING:

Image Pre-processing refers to all the transformation on raw data before it is fed to deep learning algorithm. The aim of pre-processing is an improvement of an image data that suppresses unwilling distortions or enhances some image feature important for the further processing,although geometric transformation of images.

DATASETS:

A number of experiments are carried out to verify the effectiveness of our method on the publicly available Parkinson's Progression Markers Initiative (PPMI) dataset.The experimental results show that the proposed method works efficiently on a small dataset and achieves significant classification results as compared to existing common DL methods.

4.3.FEATURE EXTRACTION USING FEATURE MATCHING:

Feature matching is an effective method to detect a specify target in the cluttered scene.this method detect single object rather than multiple objects.there are two compoents of feature matching which extract the feature of the image.first,we identify image feature,distinctive points in the images.Second,we associate a descriptor for each feature from its neighbourhood finally.we use descriptors to match features.The features which are extracted are compared to the available datasets of neurons of the parkinson’s patients and with the healthy neurons using feature matching technique and activation function to get the detailed accuracy of the given input images. 30

4.4.ACTIVATION FUNCTION OF NEURAL NETWORKS:

Activation functions are an important part of a neural network. They allow neural networks to create non linear functions to solve problems. The 3 most used activation functions are Sigmoid, TanH and ReLU. Activation functions allow or stop neurons from firing into the next layer by comparing it into the activation function thresholds.Activation functions are used both in the forward and backward propagation where in the forward propagation an activation function is used to calculate the loss where the output of a function is compared to the a real number and in backward propagation they are used to update the parameters of the neural network.

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5.RESULT AND DISCUSSION

There are many ways to diagnosis lung disease, such as Chest Radiograph (x-ray), Computed Tomography (CT), Magnetic Resonance Images (MRI Scan) and Sputum Cytology.First of all, multiple steps are involved in segmentation like; Image preprocessing, histogram analysis, threshold, morphological filling whether image is normal or abnormal. DNNs were explored to extract representative and discriminative features from X-ray images for classification in various body parts.The essential capability of DNN to capture the structure of the image in its feature maps. Further improvements are available in the areas where the abnormalities lie, possibly through the use of deep learning algorithm, and the versatility of an automated detection system

6.CONCLUSION

In this paper, a DNN classifier is proposed for the detection of the speech impairments in PWP for improving the diagnosis of the PD. The results show that the proposed classifier outperforms the other methods in both OPD and PDS databases. The DNN classifier can reduce the dimension of the data with AEs to make efficient classification. 1. The proposed DNN classifier has the ability to extract hidden features, which considerably increases the performance of the classifier. 2. The PD can be remotely diagnosed and monitored using the DNN classifier. Therefore, PWP rarely need to make physical visits to the clinic. 3. As one of the earliest indicators of the PD, the speech impairments may enable us to monitor and diagnose the PWD in vivo and discover reliable biomarkers for identifying the PD at an early stage. 4. The DNN classifier can be used as a reliable classifier for the PD thanks to its efficient specificity and sensitivity accuracy rate.

7.FUTURE ENHANCEMENT

- Lung disease is the most risky and overall in the world. Precise segmentation lung radiologist in the region of interest.
- Stated with image enhancement, used histogram automatic thresholding method; Region growing different background from lung area.

This method can be evaluated more effectively. For more accuracy we can used combine Multi-lay peptone, Support vector machine classifier.

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