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# Diagnose Parkinson's Disease Using Artificial Neural Networks

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**ABSTRACT:** Now-a-days Parkinson's disease affects millions of people around the world and consequently various approaches have emerged to help diagnose this disease, among we can use brain images. The method proposed in this study has been evaluated by a public datasets from UCI which have input and output parameters for PD diagnosis. Random Clustering Algorithm is used to focus on the affected area of the image. Adaptive Histogram Segmentation is used. This method is used to segment their part of an image and to identify the accuracy of a given image.

**KEYWORDS:** Parkinson's disease (PD), Artificial Neural Networks (ANN), Random Clustering Algorithm, Adaptive Histogram Segmentation.

## I. INTRODUCTION

According to the World Health Organisation, neurological disorders such as Parkinson's disease, multiple sclerosis and stroke are nervous system diseases that affect the brain. Parkinson's disease (PD) was first described by Parkinson is a degenerative disease of the central nervous system associated with a chronic and progressive movement disorder. It affects about 7-10 million people worldwide and 4% of people with PD are diagnosed below the age of 50.The cause is unknown and there is no cure for PD,but an early diagnosis helps in the treatment that continues throughout the patient's life. Nerve cells damage in the brain causes dopamine levels to drop, leading to the symptoms of Parkinson's disease. Dopamine plays a vital role in regulating the movement of the body. A reduction in dopamine is responsible for many of the symptoms of Parkinson's disease.

Artificial Neural Networks can be inspired by the way of biological nervous system (brain).It consists of three layers namely Input layer, Hidden layer, Output layer. In this method is based on to identify the size of a given input image.

## II. EXISTING SYSTEM

In Existing system is based on to diagnosis through handwriting exams. It is based on to identify the patient's results of an exam. Handwriting exams may be conducted on paper or by using more sophisticated methods such as digitizers or even a smartphone.It is easily obtainable and can provide diversity such as spirals, ellipses and many other ways to test the patient's ability to trace such forms. The paper exams have some printing error and not clear.

This paper compares handwriting templates and patient's handwriting using a structural co- occurrence matrix based on similarity analysis. Machine learning methods are used in handwriting exams. The first step is input image of exam template or handwritten trace can be taken and the filter to eliminate the noise of an exam template. Handwriting exams are converted into grayscale.The next step is segmentation and extraction through structural co-occurrence matrix is a method to analyze the relationship between signals. Finally find out the accuracy of Handwriting exams. Figure 2.1 shows the Existing block diagram.

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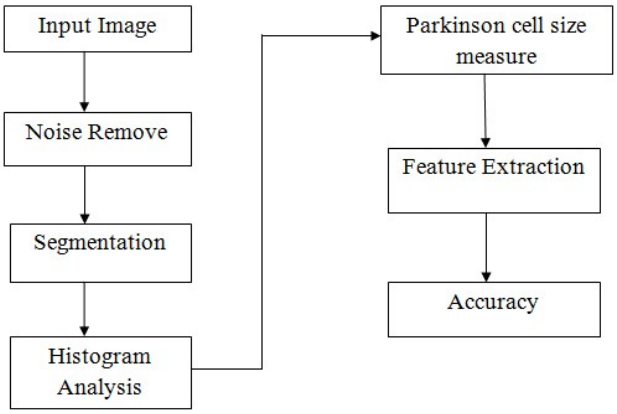


**Figure: 2.1 Existing System**

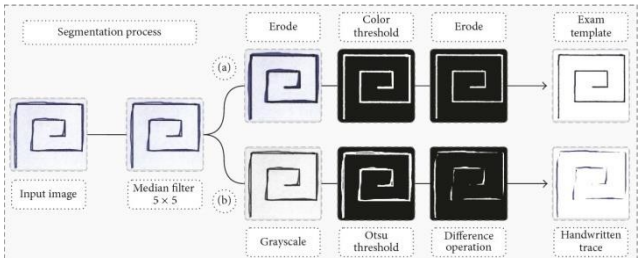


**Figure: 2.1 Existing system output**

## III. ARTIFICIAL NEURAL NETWORKS

ANN is also called as parallel distributed processing system or Connectionist system. It can be defined as the systems of interconnected neurons. Neurons or nerve cells are the basic building blocks of brains which are the biological neural networks. Researchers are designing artificial neural networks (ANNs) to solve variety of problems in pattern recognition, prediction, optimization, associative memory and control. Figure 3.1 shows the basic blocks of neural networks.

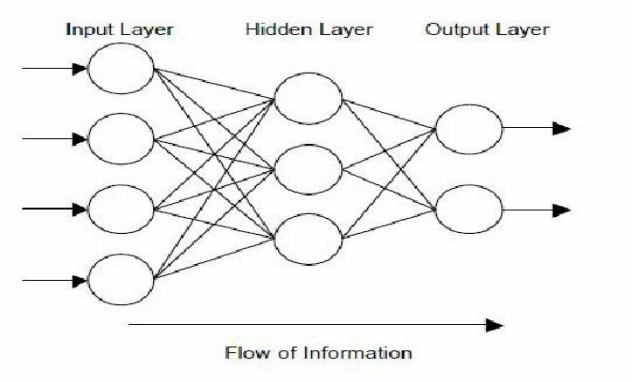


**Figure: 3.1 Artificial Neural Networks**

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There are three different layers in a Neural Network: Input layer, hidden layer and output layer .Input layer means deals with all the inputs only. This input gets transferred to the hidden layer. The hidden layers are used for processing the inputs received from the input layers .Output layer means collects and transmits the information accordingly in way it has been designed to give output and it also determines the number of neurons in this layer.

An artificial neural network is a system and this system is a structure which receives an input, processes the data and provides an output. Here, each circular node represents an artificial neuron and an arrow represents a connection from the output of one artificial neuron to the input of another.

## IV. PROPOSED SYSTEM

. In Proposed system is based on to diagnose Parkinson's disease through brain images. Figure 4.1 shows the proposed block diagram. This block diagram represents to identify the size of an image. The images are obtained by applying image processing techniques on brain images.

The first step is original brain image or affected brain image can be taken as input. The image is smoothed through filter and the to eliminate the noise of an image. The image can be converted into grayscale. Random Clustering algorithm is used to focus on the affected area of an image.

The next step is segmentation process. In segmentation method to plot the pixel values of an image in histogram method and then cleans the binary image. The next step is feature extractions are color, shape, size and texture. Extraction gives more accuracy .All feature extraction can be broadly classified into low-level and high level features Low level features depends on original images and high level depends on low level features. The next step is output image. In output image is to highlight the affected area and to find the accuracy of an image. The accuracy may be differing from different images.

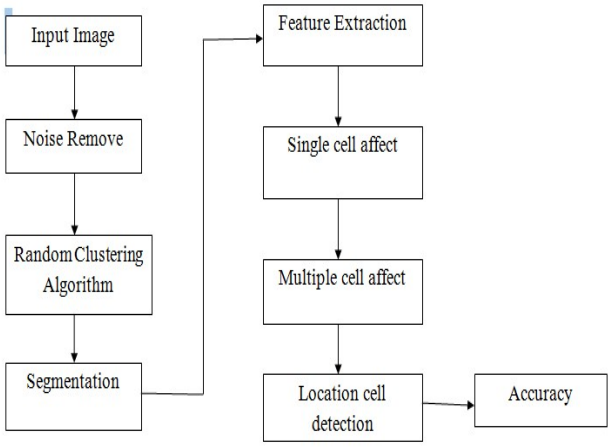


**Figure: 4.1 Proposed System**

## V. EXPERIMENTS AND SETUP

We conducted some experiments with the brain images. Some attributes were extracted by proposed system. Then, we applied random clustering algorithm method. Some of the experiments were conducted with training set, testing set and validation set. We applied random clustering algorithm in an input image to eliminate the minimal

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error of an output image. The method to evaluate system is to obtain some measures such as accuracy, sensitivity and specificity.

Accuracy was calculated by a given image and to measure the value to a standard or known value.

## VI. RESULTS AND DISCUSSION

In this paper, we provide an analysis of the results using brain images. These brain images present the patient's ability to identify the disease. The brain images using random clustering algorithm, where normal and affected images were evaluated separately. Figure 6.1 shows the comparison of images and accuracy.

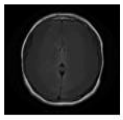
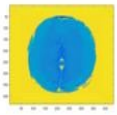
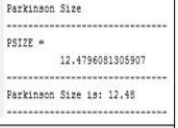
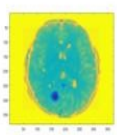
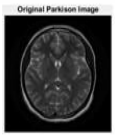
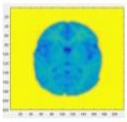
| S.NO | AFFECTED/NOT AFFECTED | INPUT IMAGE | OUTPUT IMAGE | ACCURACY |
|---|---|---|---|---|
| 1 | NOT AFFECTED |  |  |  |
| 2 | AFFECTED |  |  |  |
| 3 | AFFECTED |  |  |  |

**Figure: 6.1 Comparison of images and find accuracy**

## VII. CONCLUSION

Brain is the most important organs of human body the performance of other body parts depends on brain. The proposal of this paper is based on the brain images using artificial neural networks with random clustering algorithm.

We conclude that this is promising approach to help in the diagnosis of Parkinson's disease. These results encourage us to propose future works for feature extraction.

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