MACHINE LEARNING BASED AUTISM PREDICTION

NAME:S.KISHORE

ROLLNO:2019202027

GUIDE NAME:DR.P.GEETHA

COURSE:MCA-REGULAR(3RD YEAR)

GUIDE SIGN:

ABSTRACT

Recent Studies indicate that autism is a brain growth related disorder. Due to the structural and functional connectivity issues, the persons with autism has impact in making relationship and communication with others. Small and repeated conduct patterns are also seen in the disorder. Deep neural network efficiency is strong in many applications. In this project, we use Convolution Neural Network (CNN) to detect the autism children in earlier life cycle stage.

INTRODUCTION

MACHINE LEARNING:

In the statistical context, Machine Learning is defined as an application of artificial intelligence where available information is used through algorithms to process or assist the processing of statistical data. While Machine Learning involves concepts of automation, it requires human guidance. Machine learning is a relatively new discipline within Computer Science that provides a collection of data analysis techniques. Some of these techniques are based on well established statistical methods (e.g. logistic regression and principal component analysis) while many others are not.

PROBLEM STATEMENT

1.The problem statement is to find the child is autistic or non-autistic by using image dataset of children.

2.In existing system you cannot find the child is autistic or non-autistic by visually.

OBJECTIVE

(i)To make the image clear, we are using preprocessing method

(ii)To calculate whether it is high clustering or low clustering, we are using GLCM algorithm.

(iii)To extract featurization by means of calculating image brightness, contrast, entropy, mean, variance.

(iv)Finally we are predicting whether the child is autistic or non-autistic by using CNN algorithm.

ARCHITECTURE DIAGRAM
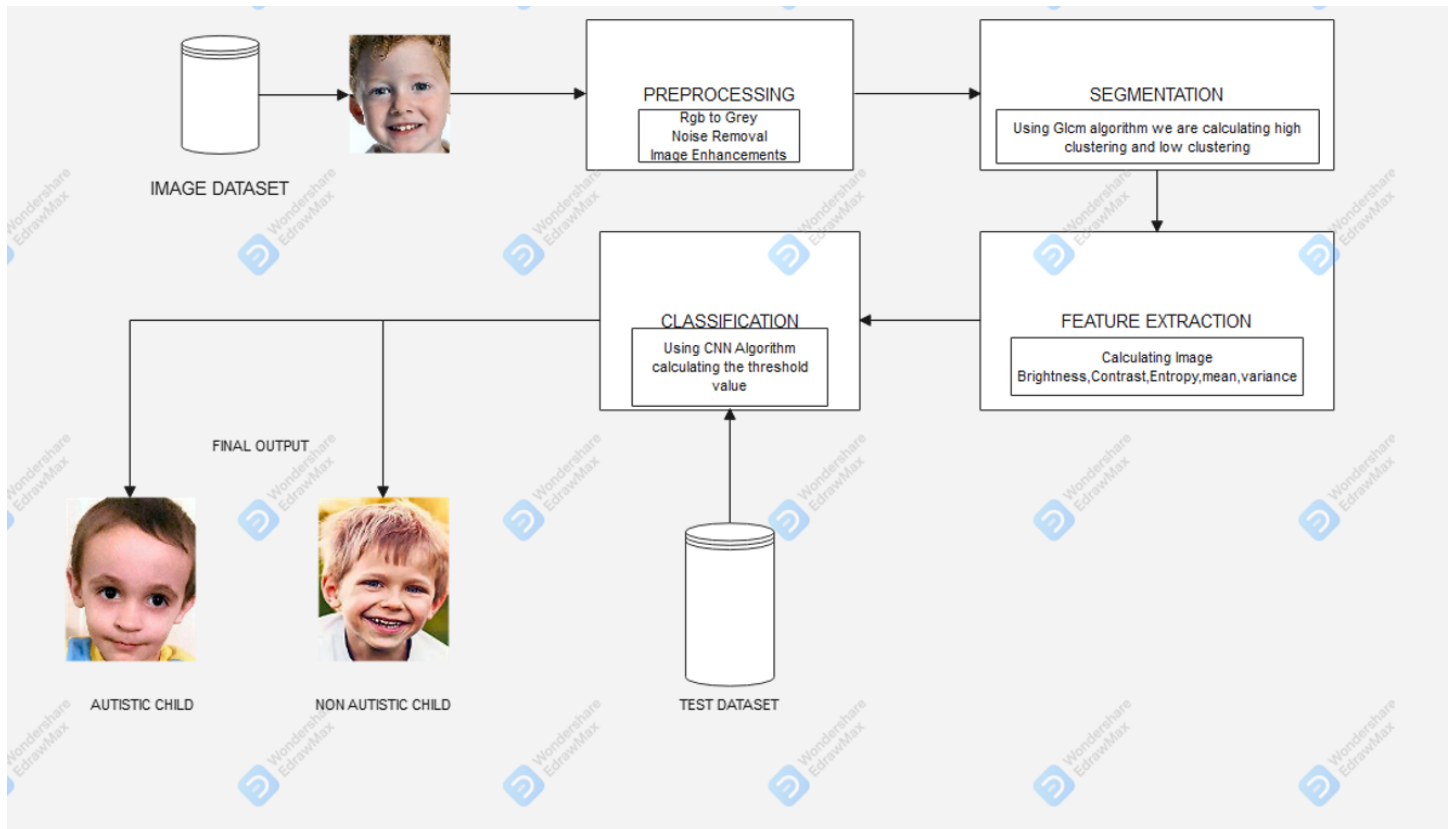
ARCHITECTURE DIAGRAM EXPLANATION

- Images are pre-processed into RGB to grey and noise removal and image enhancements are done under this process.
- In segmentation part the images are divided into face, top left, top right, lips using GLCM algorithm, high clustering and low clustering are calculated .
- In feature extraction image brightness, contrast, entropy, mean, variance is calculated
- In classification, using cnn algorithm to calculate the threshold value to predict the child is normal or abnormal child.

LIST OF MODULES

- Preprocessing.
- Segmentation.
- Feature Extraction.
- Classification.

I. PREPROCESSING:

In this module the given input image is converted into grey format.We need to check any external noise is present.If its present that noise has to be removed by median filter.Then the Image is enhanced and sent for segmentation.

II. SEGMENTATION:

In this module the given image is been segmented. We will segment the image as high and low clusters based on density and threshold. This is done by GLCM algorithm process.

III. FEATURE EXTRACTION:

In this module the features such as amplitude, contract, brightness, entropy, mean, median etc are been extracted and analyzed.

IV. CLASSIFICATION:

In this module the image is been classified using Convolutional Neural Network (CNN) algorithm. This algorithm will help in finding out whether the child is normal child or autism child.

TECHNOLOGY

Development Platform: Jupyter Notebook

Language: Python

Dataset: children image dataset(Kaggle)

REFERENCES

1. Heinsfeld, A. S., Franco, A. R., Craddock, R. C., Buchweitz, A., & Meneguzzi, F. (2020). Identification of autism spectrum disorder using deep learning and the ABIDE dataset. NeuroImage: Clinical, 17, 16-23.

2. Nair, B. B., &,Rahul Raghunath (2020). Coding and functional defect region prediction of placental protein in an embryo cell of first trimester using ANN approach. In Recent Findings in Intelligent Computing Techniques (pp. 167-170). Springer, Singapore.

3. Rani, N. S., &Vasudev, T. (2021). A Comparative Study on Efficiency of Classification Techniques with Zone Level Gabor Features towards Handwritten Telugu Character Recognition. International Journal of Computer Applications, 148(1).

4. Chanel, G., Pichon, S., Conty, L., Berthoz, S., Chevallier, C., &Grèzes, J. (2020). Classification of autistic individuals and controls using cross-task characterization of fMRI activity. NeuroI mage: Clinical, 10, 78-88.

5. Qureshi, M. N. I., Min, B., Jo, H. J., & Lee, B. (2021). Multiclass classification for the differential diagnosis on the ADHD subtypes using recursive feature elimination and hierarchical extreme learning machine: structural MRI study. PloS one, 11(8), e0160697.