OPTIMIZATION TECHNIQUES

NEURO-GENETIC DISORDERS

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ABSTRACT

Alzheimer’s and Parkinson’s disease are the most common forms of dementia that degenerate neurons in the brain cells.

This paper targets a comparative study on the performance of machine learning classifier and Neural Network techniques in neuro-degenerative data. The Neural Network algorithms gives classification accuracy ~92% with One hot Encoding Method

DATASET

The dataset we are using for our project is the ADPD dataset also known as Alzheimer's and Parkinson's disease dataset. It has 1439 attributes and 199 entries. The first attribute represents the gene names and the following attributes represent the gene experimental values of patients. The dataset was made from a congregation of multiple gene based datasets including Common Genes Alzheimer Parkinson(CGAP), brain tumor and glioblastoma. All these datasets were downloaded from Biolabs Data Set Repository which stores both experimental values and gene names.

ALGORITHM

1. Import all the necessary libraries.

2. Load the dataset.

3. We perform data pre processing

4. Define correlation between attributes and data

5. We perform one- Hot in coding and set three classes for data to classify

5.1 Class 1 AD(ALZHEIMER’S DISEASE)

5.2 Class 2 PD(PARKINSON’S DISEASE)

5.3 Class 3 Common

6. Now, we split the data in training set and testing set

7. Build our model

7.1 We use six fully connected layers

7.2 With activation function relu with 3 layers and softmax for last layer

8 We use a dropout layer wit value 0.3 to overcome the overfitting

9. For loss function we use categorical cross entropy for optimizer we use rmsprop and for metrix we use accuracy

10. Model summary : Model: "sequential"

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Layer (type) Output Shape Param #

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dense (Dense) (None, 64) 92032

leaky\_re\_lu (LeakyReLU) (None, 64) 0

dense\_1 (Dense) (None, 128) 8320

leaky\_re\_lu\_1 (LeakyReLU) (None, 128) 0

dense\_2 (Dense) (None, 256) 33024

dropout (Dropout) (None, 256) 0

dense\_3 (Dense) (None, 128) 32896

leaky\_re\_lu\_2 (LeakyReLU) (None, 128) 0

dense\_4 (Dense) (None, 64) 8256

dense\_5 (Dense) (None, 3) 195

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Total params: 174,723

Trainable params: 174,723

Non-trainable params: 0

11. We trained the model for 1000 epochs