Depression Level Detection Using Machine Learning

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1 Introduction

Depression is a major psychiatric condition that, when treated with current drugs, produces intensive complications. Over than 264 million individuals are affected globally, according to the WHO. This is a severe disease that can affect anyone from any specific age group. The severity of this disease enforced the development of different methods of machine learning to support the depressive disorder recovery process.

In order to create stable treatment for people, physicists across the nation use machine learning. By applying the Neural Network, the system would be able to provide a scientific and objective result to determine whether an individual is depressed or not. We have received from a legitimate source the actual details for this project. The next step is to apply different ways of data technology to transform and separate the data into the train set. In order to train the NN on eight thousand occurrences and to measure its output on two thousand occurrences. In addition, the objective is to create a dataset.

1.1 Objective

- Predicting the degree of depression among adult statistics.
- Multiple classes will be classified based on the estimation of our model according to the intensity of depression.
- An overview into the enormous difficulty that individuals face due to depression and offer an intuitive approach to mitigate the harm.

1.2 Motivation

Lots of public are suffering from depression, but in other nations, it's not been considered care. There are not really appropriate services in certain areas to provide an official condition. In addition, the absence of adequate care and medication makes the illness more dangerous across period. Many are frustrated by their circumstance, which lead to personal that approaches a surface tension.

Unless our system is able to reliably measure the real degree of depression, it would be exceptional. Although in this sensitive field, now there are known machine learning systems exhibiting great potential. But, with further analysis, there are still enormous opportunities to progress on a global level.

1.3 Existing Works

Over several years, researchers concentrated on anxiety analytics. There are numerous kinds of studies now under progress, mainly in developing nations, as it brings major impact. It was suggested to establish the Deep Convolutional Neural Network (DCNN) to diagnose expression depression. Along with many other analysis works. A review paper was already released on current method for detecting depression that integrated the most professional approaches in this sensitive field.

1.4 Necessity

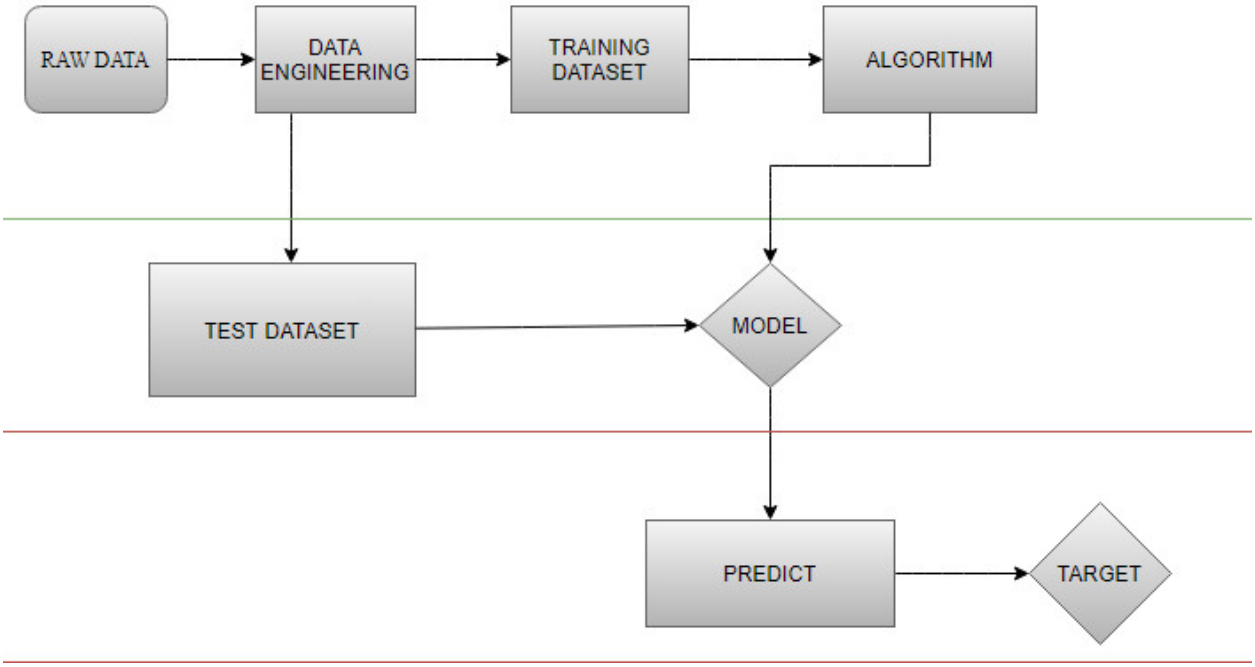
The main objective of this project is to decode a highly complex issue that lives and breathes at the center of every current culture. The model we have created over years is possible to forecast with good sensitivity the degree of depression, which can easily attract the interest of successful experts in the field of medicine and science. Even so, in recognizing specific instances to such a degree, it will alleviate the workload of healthcare experts.

2 Methodology

We picked up the information from a very well site. Afterwards, to build the Convolutional Neural Network model, we had to remove few other subset of features and break this into a data set collection. The model is able to foresee the degree of depression with acceptable results for an individual scenario.

We will use CNN for depression detection. We have collected dataset from well-known source. The dataset is well processed so we will not have to use preprocess method to process the

dataset. We will use python in this project. Python is a general purpose programming language. Python is most suitable for machine learning. we have left out the first two column because first two column is not necessary for calculation then we will train and test the data set.



3 Implementation

3.1 Data Collection

The dataset is based on the people living in rural areas. All sections were not adequately explained, so that certain elements could be removed in advance. We will not consider column A and B which are survey id and village id for detecting depression as they are not relevant for the process. We will take data column like sex, age, Married, Number _children, Education_level, total_members, gained_asset, durable_asset, save_asset, living_expenses, other_expenses, incoming_salary, incoming_own_farm, incoming_business, incoming_no_business, incoming_agricultural, farm_expenses, lasting_investment, depressed. In sex column the value 1 represent male and the value 0 represents female. And in depressed column the value 0 means no depression detected and 1 means depression detected.

3.2 Data Processing

No remarkable techniques of normalization were implemented so we have removed two functions from the current dataset (Survey_id, Village_id) such that information collected doesn't really impact throughout a design stage of education.

3.3 Model Development

The model was developed using the Convolutional Neural Network (CNN). In Neural Network Context the corresponding neural network resources 'Keras' and 'Tanserflow' were used (CNN). We divided the dataset into a series of trains, then named the Keras library and imported several features to create the CNN model. 100 secret levels are available and the size of the lots is 10. The Rectified Linear Unit (ReLU) was used for the input and the Hidden layers method for the display. We have achieved an exactness of 85.91 from the model.

3.4 Results

We have got these results so far after implementing the model. (TP; the model accurately identified as depressed), (TN; the model accurately identified as non-depressed), (FP; non-depressed cases were identified as depressed), and (FN; depressed cases were identified as non-depressed).

$$\text{True Positive} = 229$$

$$\text{True Negative} = 7$$

$$\text{False Positive} = 12$$

$$\text{False Negative} = 38$$

$$\text{Accuracy} = \text{TP+TN/TP+FP+FN+TN} = 0.834$$

$$\text{Precision} = \text{TP/TP+FP} = 0.98$$

$$\text{Recall} = \text{TP/TP+FN} = 0.84$$

$$\text{Specificity} = \text{TN/TN+FP} = 0.25$$

F1 Score = 90

4 Conclusion

For this research, mostly with aid of the Neural Network, we have established a machine-learning system to determine the symptoms of distress on a classifying basis. Significant psychiatric illnesses such as depression may also be recognized and treated by machine-learning integration.

4.1 Challenges

The important step to finish the project was the selection of the right machine learning model. In addition, it was a little difficult to locate the applicable dataset in the swift manner. Creating the ecosystem in order to build this design was another task, because several resources have been discontinued across moment.

4.2 Limitations

Our project is especially crucial in solving classification-based issues, but it does not fulfill standards with respect to the generalized data collection. In this case, before practicing, we will need to classify the knowledge to obtain greater precision.

4.3 Future Directions:

Our model will do it on some kind of actual classification dataset-based issues, for example a consumer who selects a proper annuity or personal loan, buys consumer items and detects several diseases. Many courses with indisputable data sets and further studies will boost the accuracy of the system.