CROP QUALITY PREDICTION USING ML AND NEURAL NETWORKS

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ABSTRACT

Agriculture is said to be the backbone of the economy. Farmers toil hard with different kinds of crops to make good and healthy food for the country. There are more existing systems but uses outdated machine-learning techniques based on RNN(Recurrent neural network) which makes the process slower and more time-consuming. Here We are proposing a new CNN(Convolutional neural network) based system which is fast and gives accurate results within seconds. CNN is power-efficient and is more suitable for real-time implementation. In this project, we use CNN algorithms which is very much better than the RNN algorithms used in the existing system.More parameters will be taken for the consideration of prediction in the proposed system. And we use Random Forest Regression, Multiple Linear Regression .

KEYWORDS

Convolutional neural network, recurrent neural network, Random Forest Regression, Multiple Linear Regression .

1. INTRODUCTION

Crops are grown for food and fiber. It is the important aspect of agriculture. Knowing what type of crop can be grown in a particular place is crucial for the growth of farmers and the economy, especially in countries like India. Crop production index is a measure of the production rate at a particular region. Having insights about it, can help in tremendous increase in production.

Machine learning models are implemented for prediction of crop production rate for the upcoming years. India is growing quick in population. The demand is high and can increase in coming back future. Hence, to confirm food security vertical development in agriculture is that they would like of the hour. By space regarding seventy-five-million-hour angle is rainfed and entirely depends on rains facing the vagaries of monsoon. For this a combined structural and method approach like selection origination, chemical management, integrated cropping, rain harvest home, economical irrigation techniques etc. would be needed.

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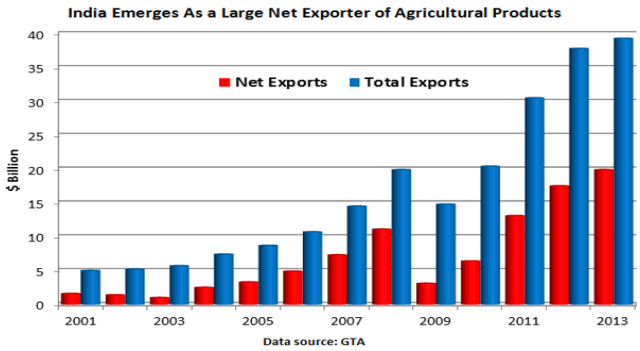


Figure 1. Chart for net exports and total exports

2. LITERATURE SURVEY

From the research article [3], the researcher express that large amount of data which is collected and stored for analysis. Making appropriate use of these data often leads to consider- able gains in efficiency and therefore economic advantages.

There are several applications of Data Mining techniques in the field of agriculture. The researchers implemented [4] KMeans algorithm to forecast the pollution in the atmosphere, the K Nearest Neighbour is applied [12] for simulating daily precipitations and other weather variables and different possi- ble changes of the weather scenarios are analyzed [14] using Support Vector Machines.

Soil profile descriptions were proposed [15] by the re- searcher for classifying soils in combination with GPS based technologies. They were applied K-Means approach for the soil classification. In a similar approach, crop classifications using hyper spectral data was carried out [1] by adopting one of the data mining approach i.e. Support Vector Machines

In a similar approach, crop classifications using hyper spectral data was carried out [1] by adopting one of the data mining approach i.e. Support Vector Machines. One of the researchers used [9] an intensified fuzzy cluster analysis for classifying plants, soil and residue regions of interest from GPS based colour images

3. PROPOSED SYSTEM

Agriculture using this information, Crop Production Index (CPI) for forthcoming years is likewise anticipated is the broadest type of human occupation where half of the total populace acquires its job. Farming Geography, managing the spatial association of yields and their fixation, gives a fascinating field with regards to which geographers can assume an indispensable job for the prosperity of the general public.

The procedure of monetary improvement involves exertion to bring efficiency up in the rural divisions that not just a little working power can deliver enough sustenance for whatever is left of the general public, yet additionally to discharge a major piece of its working hands to join the modern area. In this way raising rural profitability shapes a standout amongst the most.

The requirements specification is a technical specification of requirements for the software products. It is the first step in the requirements analysis process it lists the requirements of a particular software system including functional, performance, and security requirements. The

requirements also provide usage scenarios from a user, an operational, and an administrative perspective.

4. HARDWARE AND SOFTWARE SPECIFICATION

Hardware Requirements

- Hard disk 40GB and above
- Ram 4GB and above
- Processor i3 and above

Software Requirements

- Windows 7 and above
- Anaconda prompt
- Jupyter notebook IDE
- Python3.4

System Architecture

The overall block diagram of the system design. The image pre- processor and the image segmentation does the same task of segmenting the image to get a vivid soil portion from the image, as it may contain unwanted portions which may make the system to work with decreased efficiency

The system eventually aims at predicting the yield of crops based on the set of whether and yield data including geographical parameters.

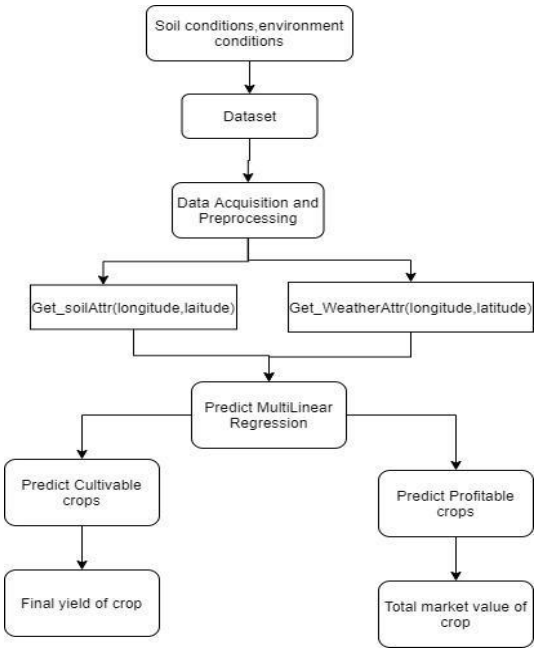


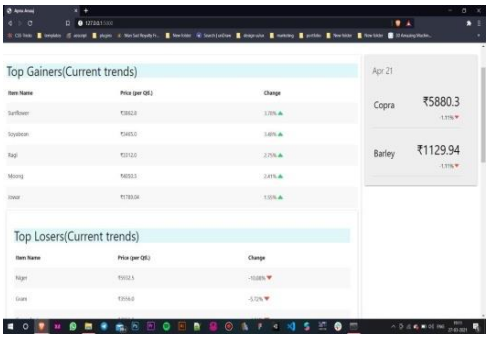
Figure 2. . Architecture diagram

5. SAMPLE CODE

```
    def TopFiveWinners():
    current_month = datetime.now().month
    current_year = datetime.now().year
    current_rainfall = annual_rainfall[current_month - 1]
    prev_month = current_month - 1
    prev_rainfall = annual_rainfall[prev_month - 1]
    current_month_prediction = []
    prev_month_prediction = []
    change = []

    for i in commodity_list:
        current_predict = i.getPredictedValue([float(current_month), current_year, current_rainfall])
        current_month_prediction.append(current_predict)
        prev_predict = i.getPredictedValue([float(prev_month), current_year, prev_rainfall])
        prev_month_prediction.append(prev_predict)
        change.append((((current_predict - prev_predict) * 100 / prev_predict),
commodity_list.index(i)))
    sorted_change = change
    sorted_change.sort(reverse=True)
    # print(sorted_change)
    to_send = []
    for j in range(0, 5):
        perc, i = sorted_change[j]
        name = commodity_list[i].getCropName().split('/')[1]
 to_send.append([name, round((current_month_prediction[i] * base[name]) / 100, 2), round(perc,
                                                    2)])
    print(to_send)
    return to_send
```

Screenshots



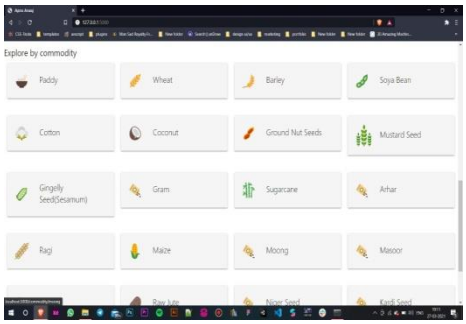


Figure 3. Project images

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