Crop Price Prediction System

Prof. Rama Bansidhar Dan
Dept. of ISE
MVJ College of Engineering
Bangalore,India

K R Chandan
Dept. of ISE
MVJ College of Engineering
Bangalore,India

Nanda kishore
Dept. of ISE
MVJ College of Engineering
Bangalore,India

Arpit Mishra
Dept. of ISE
MVJ College of Engineering
Bangalore,India

Abstract— Each and every sector in this digital world is undergoing a dramatic change due to the influence of IT field. The agricultural sector needs more support for its development in developing countries like India. Price prediction helps the farmers and also Government to make effective decision. Predicting the vegetable price is essential in agriculture sector for effective decision making. This forecasting task is quite difficult. Neural network is self-adapt and has excellent learning capability and used to solve variety of tasks that are intricate. This model is used to predict the next day price of vegetable using the previous price of time series data. The three machine learning algorithms are incorporated in this work namely Radial basis function, back propagation neural network and genetic based neural network are compared. The models are assessed and it is concluded from the derived accuracy that the performance of genetic based neural network is better than back propagation neural network and radial basis function and improves the accuracy percentage of vegetable price prediction. Based on the complexity of vegetable price prediction, making use of the characteristics of neural networks such as self-adapt, self-study and high fault tolerance, to build up the model of Backpropagation neural network to predict vegetable price. A prediction model was set up by applying the neural network. Taking tomato as an example, the parameters of the model are analyzed through experiment. At the end of the result of Backpropagation neural network shows absolute error percentage of monthly and weekly vegetable price prediction

and analyse the accuracy percentage of the price prediction.

Keyword- : Neural Networks; Back-propagation (BP); Vegetable Price

1 INTRODUCTION

Agriculture is the most important sector of the Indian Economy. Indian agriculture sector accounts for 18 percent of India's GDP and provides employment to 50% of the country's workforce. But latest studies have shown a steady decline in the contribution made by agriculture to the Indian economy although it is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India.

A possible reason for the poor contribution of the agricultural sector to the GDP of India may be the lack of adequate crop planning by farmers as well as by the government. The GDP is one of the main indicator that is used to find the health of a country's economy. Rapid fluctuations in crop prices are common in the market. These fluctuation in prices is mainly because of lack of prior planning. This leads to fluctuation in the production and even the price of a crop in the market. It can lead the crops to be highly priced, being a disadvantage for the consumer, when the price hikes and farmers to suffer with lose in

investment when the price drops. In such a scenario, it is difficult for a farmer to make an educated choice of crop to grow in his land or to estimate the yield and price to expect from it. The intention of this project is to help the farmer make better decisions, by analyzing historical yield and price data using machine learning.

Machine Learning is an application of Artificial Intelligence that has proven to produce good prediction models in various aspects such as stock market, weather, outcome of decisions, crop , and in our case crop yield and price. Machine learning algorithms are divided into three main groups based on their purpose:

2 OBJECTIVE

The central focus of this project is to predict crop price based on the previous trends in weather, yield and price in the districts under consideration. In a agri-based country like India, predicting crop yield and price can aid a lot of people whose sole survival is dependent on the crop that they plan to grow.

4 METHODOLOGY

In this section we will discuss the methodology that we are using to avoid accidents block diagram of the proposed system is shown below

● The system develops an android application where the user can sign up his/her credentials which will be his/her mobile number and a password as shown in Figure

● The user then gives the land location and the date on which she/he plans to plant the crop, as input. The system will take into account, the farming season and determine which of the six crops(AusRice,Aman-Rice,BoroRice,Potato,Wheat,Jute) can be cultivated during the season or time frame.

● The system then finds the location of the given region and predicts the percentage increase or decrease in yield per unit area of the determined crops for that particular year and region.

● The user can then select the predicted crop or any of the other suggested crops.

● Based on user's choice, the system will now suggest the appropriate resources needed and create the schedule of entire farming process.

● In this system, there is a local server in the android phone of the user.

● Server side from the administrator perspective – main server will do the calculations beforehand.

● The Android app uses decision making algorithm to predict which crop will be cost effective.

● Then the evaluated results will be saved in the local server for different input sets.

● The analysis is done using the Multiple Linear Regression (MLR) and the KNN algorithm.

● The system concludes that MLR algorithm gave more accurate results and was incorporated in the android application.
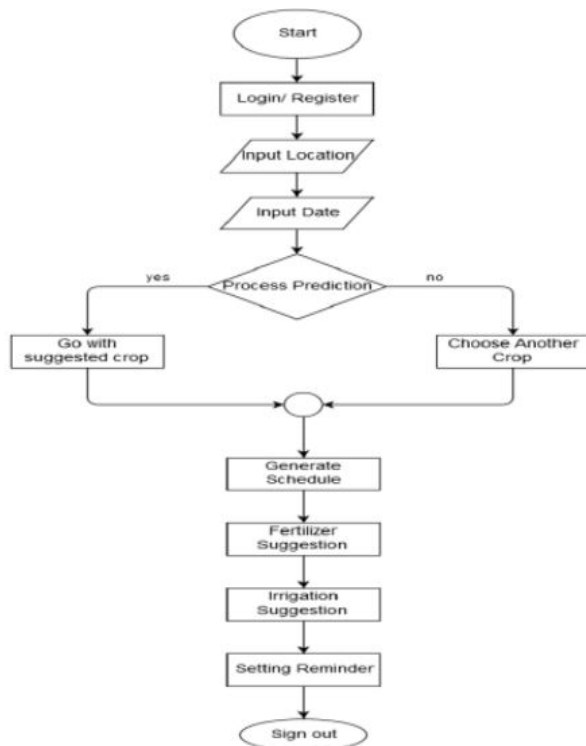
Figure 1: Block diagram of our proposed system

4.1 Algorithms used

ML Algorithms like Neural networks,linear regression,decision tree

4.1.1 Data Collection

In this work, the process starts from data collection where real- time agricultural and market data is collected and stored in csv (comma separated value) format. The weather data is collected from GKVK, yield data from APS (Agriculture Production Statistics) website and the price data from DES, agmarknet and krishimaratavahini. The data is then preprocessed to make it suitable for applying prediction algorithms.

4.1.2 Data Preprocessing

Data preprocessing is an important step of solving every machine learning problem. Most of the datasets used with Machine Learning problems need to be processed / cleaned / transformed so that a Machine Learning algorithm can be trained on it. Most commonly used pre-processing techniques are very few like - missing value imputation, encoding categorical variables, scaling, etc. These techniques are easy to understand. But when we actually deal with the data, things often get clunky. Every dataset is different and poses unique challenges. Preprocessing refers to the transformations applied to our data before feeding it to the algorithm. Data Preprocessing is a technique that is used to convert the raw data into a clean data set.
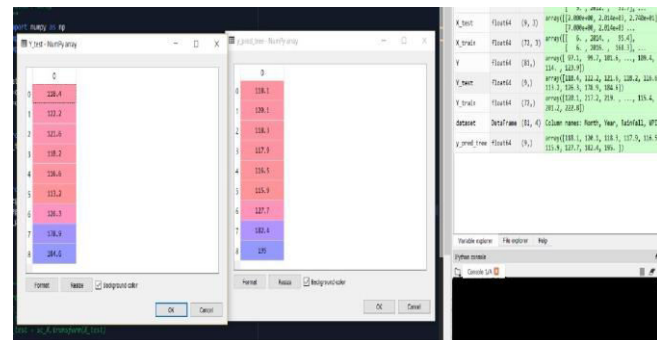
4.1.3 Predictor

The model training and testing is carried out in the Predictor module. Two different

algorithms are used for yield and price prediction. Multilayer Perceptron is used for yield prediction and LSTM is used for price prediction. Multilayer Perceptron is a class of feedforward Artificial Neural Network which constitutes three layer : Input layer, Hidden layer and Output layer. The nodes in the hidden layer use an activation function to train the data that is passed on to the respective layers.

5. SYSTEM HARDWARE AND SOFTWARE CONFIGURATION

5.1 Hardware Components

The following is the hardware requirements of the system for the proposed system:● Processor :2.2 GHz

● RAM :16 GB

● Hard Disk :1 TB

● Display :15inch color

Software Requirement

The following is the software requirements of the system for the proposed system:

● OS:Windows

● Platform:ML

● Language:Python

● IDE/tool : Jupyter Notebook

6. EXPERIMENTAL RESULTS

7. CONCLUSION

The proposed model has been developed to help farmers to make better decisions with respect to which crop is most suitable during desired time of sowing and the location.

Our model predicts the price of the crop of choice, giving the farmer useful information well before starting the process of cultivation.

Numerous prediction algorithm can be used for crop price prediction such as decision

trees, neural networks, regression etc. Our model uses Decision Tree and Regression.

REFERENCES

1. A Comparison of Regression Models for Prediction of Graduate Admissions Mohan S

Acharya ; Asfia Armaan ; Aneeta S Antony 2019 *International Conference on*

Computational Intelligence in Data Science(ICCIDS)

2. A decision trees approach to oil price prediction Nnamdi I. Nwulu 2017 *International*

Artificial Intelligence and Data Processing Symposium (IDAP)

3. Crypto-Currency price prediction using Decision Tree and Regression techniques

Karunya Rathan; Somarouthu Venkat Sai ; Tubati Sai Manikanta 2019 *3rd*

International Conference on Trends in Electronics and Informatics (ICOEI)

4. Accuracy Prediction for Distributed Decision Tree using Machine Learning

approach Siddalingeshwar Patil ; Umakant Kulkarni 2019 *3rd International Conference*

on Trends in Electronics and Informatics(ICOEI).

5. Tian Guo, Nino Antulov-Fantulin, "Predicting short-term Bitcoin price fluctuations

from buy and sell orders" Machine Learning , arXiv:1802.04065, Feb 2018