**Crop Yield Prediction Using Machine Learning and Deep Learning Models**

**Abstract**

In this project we are using machine learning and deep learning algorithms to predict future crop yield based on weather data such as temperature and rainfall. If farmers know the crop yield before sowing based on historical weather data, then he may take better decision. So, by employing machine/deep learning algorithms we can inform farmers about future crop yield. In proposed method we are using Irish Maize and Potato yield dataset to train all machine learning models and then these models can be used to predict future crop yield. In proposed method we are using random forest, SVR, **DNN, CNN, ANN and LSTM**. So, we have implemented all 6 algorithms on both datasets. To evaluate performance of each algorithm we are calculating MSE and R2 Score where MSE refers to mean square error (difference between TEST crop yield and predicted yield). R2 refers to correct prediction rate. So, for any algorithm MSE must be lower and R2 must be higher for better crop yield prediction.

Keywords: crop yield prediction, Mean square error , R2 value , RF, ANN, DNN LSTM.

**Existing Methods**

1. Farmers are Manually planning of crops without consulting
2. With consulting of experts

**Drawbacks**

1. Yield is not good
2. Time and cost
3. Person to person results may vary

**Proposed Method (performance of 6 algorithms)**

1. Deep learning (4)
2. Maize and potato datasets

**Advantages**

1. Higher accuracy
2. Time and cost will be saved
3. Values of yield will be same every time

**Applications**

1. Agricultural departments
2. Farmers

**SOFTWARE AND HARDWARE REQUIRMENT SPECIFICATION**

**Hardware Requirement:**

• Processor Type: Pentium -IV

• ROM: 512 MB

• RAM: 4 GB

• Hard disk: 20 GB

**Software Requirement:**

• Operating System: Windows 2007/8/10/11

• Script: **python Jupyter notebook**

ANN: is a group of multiple perceptron or neurons at each layer. ANN is feed forward neural network.

CNN: it contains one or more convolutional layers. These convolutional layers creates feature map.

LSTM: LSTM is special model used for time series prediction.

DNN: deep CNN