Weather Forecast Prediction for Agriculture - A Survey

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***Abstract*—Weather forecasting for agriculture and terrace gardening is the process of what the atmosphere will be indifferent lands o, to estimate the weather condition for growing plants and getting yield. We should use technology. By this, we can predict the things like rainy, windy, sunny, stormy, flood and variation in temperature, etc. In this paper, we can expect the farmers said that entire agriculture depends on the Weather forecast for agriculture and terrace gardening. And it helps farmers'.In some of the places upon the weather. So, it is important to be concerned, to be identified any methods for weather forecasting to predict its changes, which would affect the economy of the country.**

Nowadays, the weather is making a bad impact, as society is growing more and more, causing much damage, injury, and loss of life of farmers. By implementing weather forecast prediction the remote areas will be helpful and they are the main motivation for making this work fulfilled.

In this paper, a low-cost solution for weather forecast prediction is present

Keywords*— *ML Techniques, Accuracy calculation, Data collection.

I. INTRODUCTION

The monsoon weather forecast is most important for farmers in India, as India has a vast aggro-economic country and is the backbone of our country. Agriculture production in India is directly dependent on weather prediction and monsoon performance.

Research has shown that the monsoon season of 2020 was predicted to have substantial rainfall over most regions of India which causes flood situations in different various regions of India.

Many of the researches and predictions of
Researchers showed the usefulness and help of weather Forecasts in the medium range in Indian Agriculture. The Aggro-meteorological advisories on the present climate Estimate and it is shown to be valuable in Decision-making Progression in every rainwater harvesting, farmhouse, Sicknesses, control of pests, crop planning, etc.

As farming plays a very dynamic role in an Indian Economy Farming includes types of crops Ra bi, Kharif, and Zaid crops.

Kharif crops: These crops are propagated in June-July when the first rains start to fall (downpour crops) Gathered in the month of September-October necessitates abundant amount of hot water and water to grow.

Ex: sorghum, almonds, figs, pulses, etc.

Rabi crops: These crops are strewed in October and November then Gathered in April-May Needs a warm temperature for the sprouting of spores and mellowing and cold temperature for growth. Ex: guava, lime, linseed, toria , red gram ,oil seeds, sunflower, etc.

Zaid crops: These crops grow from March-June amid Rabi and Kharif crop seasons. It is an early ripening crop. Ex: Cucumber, Bitter Gourd, Pumpkin, Watermelon, Muskmelon, Moongdal, etc.

So, all these types of crops grown in India must have a correct prediction of the weather forecast. For this reason, we have come across these situations. So, to overcome the problem of climate weather, weather prediction plays a vital role. It can predict whether the weather is sunny, rainy, or cloudy. This paper helps the farmers to predict the weather

II. RELATED WORK

I. Sanjay Khajure[a], S.W.Mohod[b]et.al. has identified the errors in the predictions of Neural network with fuzzy inference system problem, He has used FIS(Fuzzy Inference System) method and have[Type here] obtained the forecast of the month June and July 2015 are noted with their predicted values and the actual weather condition of that day as per result.

II. Ivonne Angelia Castiblanco Jimenez*, Laura Cristina Cepeda GarciaID et.al. have identified the problem, they have focused on 3 parts namely agronomy, effective education, and virtual authenticity method, and have obtained that virtual reality is the less explored as result.

III. https://gargicollege.in has identified the problem,They have used a neural network model in weather forecasting techniques and have obtained the Fuzzy ARTMAP Neural network architecture result.

IV. MICHELE KREMER SOTT [1,2], LEONARDOBERTOLINFURSTENAU [1], LIANE MAHLMANN KIPPER[1], FÁBER D. GIRALDO [2], JOSÉ RICARDO LÓPEZ-ROBLES [3], MANUEL J. COBO [4], ADNAN ZAHID [5], (Graduate Student Member, IEEE), QAMMER H. ABBASI [5], (Senior Member, IEEE), AND MUHAMMAD ALI IMRAN [5], (Senior Member, IEEE) et.al. has recognized the tactical refrains of the arena of education and most used A4.0 techniques, they have used PA methods and A4.0 technologies for coffee part through an SLR by BNPA method and have obtained agriculture 4.0 technologies as a result.

V. Lefteris Benos [1], Aristotelis C. Tagarakis [1], Georgios Dolias [1], Remigio Berruto [2], Dimitrios Kateri's [1] and Dionysis Bochtis [1,3],* et.al. have identified the problem, they have used methodology based on PRISMA guidelines and have obtained Yield Estimate, Disease Detection, Weed noticing, Crop appreciation, etc as a result.

VI. Munmun Biswas BGC Trust University Bangladesh **14** PUBLICATIONS**51** CITATIONS, Tanni Dhoom Premier University **3** PUBLICATIONS**5** citations. al. has identified that there were no more attributes of weather prediction problem, they have used data mining techniques namely Chi-square test and Naive Base statistics are applied on the data set to extract the useful information from the data set, method and have obtained analyzing and measuring weather Data as a result.

VII. Bogdan Bochenek 1,* and Zbigniew Ustrnul 1,2et.al. has identified did not intend to current any view of per issue (e.g., in the domain of weather differ at least13 certain qualities can be eminent, https://vitalflux.com/machine-learning-use-cases climate-alter/, acquired on 17 December 2021), but to show only the most dominant and pleasing issues, which were acquired through text mining of analytic announcement, and to prove that machine learning techniques can be used with victory in earth science and climatology problem, they has used the key goal of this learning is to the existing analysis of the machine learning methods and appeal within the main topics of meteorology, as well as in climate analyses method and have obtained Weather Prediction and Climate analyses result.

VIII. Arthur Bossavy, Robin Girard, Georges Kariniotakiset.et.al. has identified the first task in ramp forecasting is to suitably define a ramp and anticipated a definition based on filtering, directed by the significant signal processing literature on edge detection problem, they have used wind farm with a minimum capacity of 8MW, located on a composite terrain in the south of France (a few 12 kilometers from the Mediterranean Sea). Power measurements carried by the SCADA system of the wind farm were considered to have obtained forecast ramps from either the commonly known poor man's troupe, or troupe derived from multivariate analytical sampling, such as those anticipated in [48]. The last-mentioned could provide a best substitute to the numeral weather estimate troupe for forecasting ramps, as their generation can be the far less computationally costly result.

IX. A H M Jakaria Tennessee Tech University Cookeville,Tennesseeajakaria42@students.tntech.edu Md Mosharaf Hossain Tennessee Tech University Cookeville, Tennessee mhossain44@students.tntech.edu Mohammad Ashiqur Rahman Tennessee Tech University Cookeville, Tennessee marahman@tntech.eduet.al. has identified the use of unlike sensors could raise the figure of localized structures in the training dataset. This data, along with the atmospheric condition station data problem, have used ML techniques to expect the temperature of the succeeding day at an exact hour in the city of Nashville, Tennessee, based on the weather data of the recent day in this city and a pair of its nearby cities and have obtained presented a technology to use machine learning techniques to afford weather forecasts. Machine learning technology can provide intellectual models, which are much easier than the traditional physical result.

X. M. G. Schultz, C. Betancourt, B. Gong, F. Kleinert, M. Langguth, L. H. Leufen, A. Mozaffari and S.[Type here] Stadtler et.al. have identified the estimation of forecast uncertainty, they have used two facets of ML in weather conditions and environmental condition, which we have recovered to be significant in our real circumstances and where high-grade activity differ amid the meteorologic(earth science) and Machine Learning groups. These are data training and model valuation. This communication may cast some light on the account why it has been challenging for the DL groups to gear (tackle) weather data glitches and have obtained the potentiality of ultramodern DL tactics to progress strictly data-driven lengthwise weather forecast use results.

III. METHODOLOGY

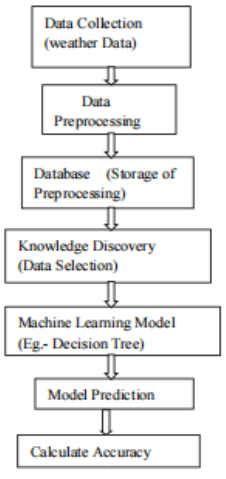

Fig:3.1. Methodology

FORMULAE:

Accuracy Formula= (True Positive + True Negative)/ (True Positive + True Negative + Type 1 error + Type 2 error)

Precision= TP/ (TP + FP)

Sl. No	Author	Challenges Identified	Methods used	Result Obtained
a	Sanjay Khajure[a] ,et. al.	Neural networks with fuzzy inferences stem	FIS(Fuzzy Inference System)	Achieved better results.
b	MICHEL E KREMER SOTT[1,2], ,et.al .	The strategic themes of the field of study and most used A4.0 techniques	Agriculture 4.0 technologies	A4.0 technologies for the coffee sector
c.	https://gargic college.in	Neural network model	neural network model in weather forecasting technique s	the Fuzzy ARTMAP Neural network architecture
d.	Lefteris Benos[1] et.al.	methodology	A methodology based on PRISMA guidelines.	62% Yield prediction disease and detection

IV. ALGORITHM.

A. Assemblage of open source weather details.
B. Load/Read database.
C. Preprocessing.
D. Past weather selected data details.
E. ML model prediction.
F. Accuracy calculation.

A. Assemblage of open-source Weather details.

The form of the atmosphere at a specific time and place, weather includes conditions such as wind, velocity, barometric pressure, temperature, precipitation, and humidity. Forms of weather include sunny, cloudy, rainy, windy, and snowy.

B. Load/Read database

This function will load complete data available in the database and provide it to user.

C. Preprocessing

In this system, data is collected in the databases are categorized in groups.

D. Past weather selected data details

The next section is the past weather details. Here, the weather details of the past days can be done. This has resulted in the last five years where data, months, and years were asked from the customers after asking for the details. If all parameters are exact then, it will fetch the data. Firstly, based on the month value it jumps to the month cluster after evaluating the date and year, it fetches the complete data available in the database for the specified data.

E. ML Model Prediction

In pre-harvesting machine learning is used to seizure the factors of soils, seeds superior, fertilizer utilization, cutting, hereditary and environmental situation and irrigation . Concentrating on apiece element it is very crucial to lessen overall losing in product.

F. Accuracy Calculation

We have used Accurate Confident, Accurate Undesirable, Wrong Confident, and Wrong Undesirable values aimed at generating the accuracy of weather forecast prediction.

V. OUTCOMES AND DISCUSSION.

In this unit, we have predicted the accuracy of weather forecasts through the ML technique.

In the future, his weather forecast prediction should be predicted through the IoT technique and it will be and will be very much useful for agriculturists.

VI. GRAPH:

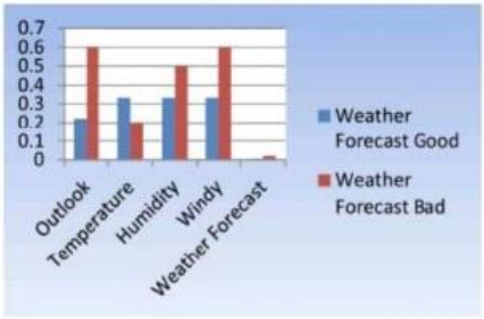

Fig.2. Weather forecast prediction.

VII. CLOSURE AND IMMINENT WORK.

In this stuff, we accessed expertise to use machine learning techniques to afford weather forecasts. So it can provide intellectual representations, which are much more modest than out-of-date physical representations.

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[12] Kaitlin Togliatti[1] , Sotirios V. Archontoulis[1]*, Ranae Dietzel[1], Laila Puntel[1] and Andy VanLoocke[1]
[13] Igor Oliveira, Renato L. F. Cunha, Bruno Silva, Marco A. S. Netto IBM Research
[14] Stephan Rasp1 , Peter D. Dueben2 , Sebastian Scher3 , Jonathan A. Weyn4 ,Soukayna Mouatadid5 , and Nils Thuerey1
[15] Peter D. Dueben and Peter Bauer.