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**Contribution:**

The Different layers of the Atmosphere based on temperature are: Troposphere, Stratosphere, Mesosphere and Thermosphere.

The Long wave radiation (Green house gases) are primarily absorbed by water vapor and carbon dioxide.

The atmospheric window is the range of wavelengths not absorbed.

The temperature gradient develops as the surface warms. The energy transfer upward through convection is induced by the temperature gradients.

The energy is transferred downward at nights.

There are two processes in fluids that generate convection. They are: Free convection and Forced Convection. The incoming and outgoing radiation generate the earths radiation equilibrium.

The equation of state describes how pressure, Temperature and density are related to one another.

The air density and pressure are directly proportional at constant temperature.

The increase in temperature causes an increase in pressure under constant density.

The movement of air is provided by the pressure gradients. The large areas are concentrated

with small gradients. The large pressure gradients across small areas are displayed by hurricanes

and tornadoes.

With the altitude, the pressure gradients always decreases. The mass is proportional to gravitational force. The pressure gradients lead to hydrostatic equilibrium for warm air.

The pressure gradients lead to hydrostatic equilibrium for cold air. When the atmosphere is saturated

,it generates saturation vapor pressure.

The vapor pressure on surfaces is generated by the movement of water vapor

Saturation vapor pressure depends on temperature. The saturation vapor pressure increases rapidly

at higher temperatures.

The addition of water vapor, moist air causes the air to become saturated. The addition or removal of energy is done by the diabatic process. The adiabatic process is the process in which cloud formation

involves temperature changes. The decrease in air temperature with height is referred by the environmental lapse rate.

**Competitors article:**

The author uses the artificial intelligence techniques for forecasting wind power. The meteorological forecasts are used for improving predictions. The method of applying

Forecasting method on power production shows the validity of the method.

The priority of the grid operator is to predict changes in the wind power. Researches focus on

A forecasting tool to predict wind power with good accuracy. The model output statistics is used to reduce the remaining error. The physical models may use the numerical weather predictions. Researchers have developed models for short term prediction based on fuzzy neural networks.

The main contribution of the numerical weather prediction is to make them available based on fuzzy logic rules. The time series of wind power is used as input and the proposed model is based on neural networks. The forecasting models contain information about the wind speed, Wind direction and temperature.

The numerical weather predictions provide information in the long term horizons.

The spatial resolution of the meteorological model is the factor on which accuracy is dependent on. Models with high resolution require more time, but perform better.

The numerical weather predictions contribute to the accuracy having effect on the long time and short time horizons. In order to optimize the use of Numerical weather predictions, artificial neural networks combined with fuzzy logic are used. Inaccurate numerical weather predictions make the wind power prediction difficult.

Weather forecasts are uncertain because they depend on the spatial and temporal resolution

of the Numerical weather predictions. The contribution of the proposed method is that it uses

artificial neural network with a fuzzy logic model. The author outperforms my algorithms in this aspect.

**Reference for Competitor article**:

Sideratos, G., & Hatziargyriou, N. D. (2007). An advanced statistical method for wind power forecasting. *IEEE Transactions on power systems*, *22*(1), 258-265.

**My algorithm:**

Weather forecasting is a complex process which needs reliable data to make accurate

predictions. Weather forecasting developed meteorology as Science, where meteorologists are

extensively used in making the weather predictions.

weather data is collected to study weather forecasting. Weather prediction makes use of numerical data such as temperature, atmospheric pressure and humidity.

The different forecast range types are short range forecast, extended forecast, Medium

forecast, Long range forecast.

weather forecasts need more improvement even though the modern technology

is being used. The earth’s atmosphere is a complex process where rain or snow cannot always

be predicted.

Temperature warnings are used to protect life and property. The data about the state

of the atmosphere is calculated. The back propagation neural networks which comes

under Neural networks is used to calculate the temperature which supports various algorithms.

A Neural network is the efficient data model used to study the input/output relationships.

A Neural network represents the human brain in functioning. . The neural network collects the

Input data called the testing data and processes it to make classification and prediction.

The several steps in prediction are data collection, data analysis, prediction, output processing.

The support vector machines are also used for weather prediction. The time series data is used

to calculate the maximum temperatures of two to three days. The parameters which need to

be analyzed are: Atmospheric pressure, Temperature, Humidity, wind velocity and wind direction.

We start with the initial conditions and put them in the statistical models and we get the predictions.

Bayesian probabilistic arguments are used for numerical weather prediction. The supervised learning techniques are applied to the prediction problems. The weather prediction is achieved by the projection of uncertainities. The green house effect was discovered by Joseph Fourier in 1824.

The increased levels of greenhouse gases warms the earth. The number of high temperature events has been increasing since 1950. Global warming is permanently changing the Earth’s climate.

Fourty two percent of the scientists think that the Global warming is happening.

The Global warming results in rising sea levels due to the melting of the polar ice caps.

The amount of the water in the atmosphere affects the temperature. The factors affecting the weather conditions are temperature, pressure, humidity, precipitation and wind.

**Quantitative Results:**

The final decisions are based on the certainity of each classifier. The different results are produced

By the different networks. From the view point of bias, the Neural networks bring about greater accuracy.

The final decision is obtained by the certainity of each classifier. Artificial Neural networks does the training and testing of data in its models.

To minimize the Mean square error, the initial weights are trained.

The lower error and a reasonable learning time are the characteristics of the optimal network.

The different data patterns result in the different values of temperature, humidity and wind speed.

The Neural networks are employed for hourly weather forecasting.

There is a challenge today to study the climate change and minimize the energy savings.

The room temperature is kept within the range to build climate control heating. The different

actuators keep the room temperature in the comfortable range. The Actuators settings are adjusted to minimize the energy costs.

For simulation and control, a bilinear model is used. The actuators are in each system. They are employ

ed for the following subsystems such as heating, cooling, ventilation.

The non linear problems are satisfied by the sequential linear programming.

Performance bound is used for perfect weather and its predictions.

There is an urgent need for reliable warning systems as the severity of floods increases.

The part of the uncertainities are predicted by the EPS forecasts.

In an urban atmosphere, the real time forecasting is caused by the neural network.

The success index forecasting is 78% with the neural classifier. In the real world a model called Neurozone is being used. The training data is updated every year. The air quality agencies perform tasks like monitor pollutants and inform authorities and public. The first air quality model

Is a combination of chemistry, transport and dispersion.

The second model connects the level of pollutants directly to the meteorological conditions.

For the real time forecasting , the second approach is preferred. The daily ozone concentrations are affected by the daily emissions. The variability of the Ozone levels is best explained by the daily weather variations. The photochemical smog is produced in the summer where high temperature

And low humidity prevail. The air quality agencies use the available variables in the statistical regression function to predict the weather.

**Data and method**

All the weather predictions are based on the data from the US National weather service.

Wet bias is when the weather forecasters predict more rain than the actual rain.

Weather predictions are based on sound decisions to help people in their day to day activities.

Super computers are used to study the mysteries of weather and climate.

Weather forecasting has led to safe transportation, productivity and resilience.

There will be more benefits to the individuals if the weather forecasting techniques are improved.

The warnings of weather conditions have increased from 13 minutes to 69 percent over time.

Researches have developed a Radar which predicts the weather more accurately.

Accurate forecasts helps in optimizing the staff in the various areas of business and sectors of the industry.

Weather forecasting may undermine people’s ability in the day to day activities.

Predicting the rain is harder. Global warming affects every nation.

Businesses like Walmart, JPMorgan Chase have developed their own statistical models to predict extreme weather conditions.

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predictions. Weather forecasting developed meteorology as Science, where meteorologists are

extensively used in making the weather predictions.

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**Conclusion:**

Weather forecast has influence in the yield of crop. Weather aberrations may cause soil erosion. The

Weather has an impact on every aspect of crop culture. The spatial variations in an area at a given time are showed by the climatological basis weather factors. The selected interval and the year to year fluctuations have to be considered for the cropping purposes. The variability is greater degree, The time unit is of shorter degree. Rainfall is the most variable over the short periods of time. For optimal productivity, the hazardous weather has to be avoided. There are higher frequencies of normal weather deviations every year. The adverse effect of weather can be managed if the weather forecast is available on time. The crop culture practices are adopted to minimize the effect of hazardous weather.

The medium range forecasts help in carrying out cultural operations. With the latest technologies coming up the farmers are getting better weather forecasts. High cost decisions like organization and execution take some time. The mid seasonal forecasts must be communicated five days prior.

The control operations against pests and diseases and irrigation are high cost decisions. Weather forecasts are expected to be accurate and timely. Rains are required for the sowing of crops and soil moisture. Rains contribute to the crop water needs. The use of dependable precipitation is suggested for delineation of start and end of crop growth period. Clear weather must be preceded with soil moisture storage. Forecasts of dry spells and wet spells are required for disease control measures.

The radiative cooling will be maximum under cold nights and minimum with warm night temperatures.

The meteorological conditions are described by the weather forecast over an area and time. Because of the crop weather there are variations in the cropping practices. Dominant technology, broad casting needs are some of the criteria on which weather forecasting is defined. Short range forecast and long range forecast are some of the different types of forecast. Rainfall, snow, dewpoint temperatures are some of the different parameters of weather forecast.

Animal husbandry, crops and forestry can be referred to by specialized forecast. The initial forecasts need to be modified for the further forecasts needed for agricultural purposes. Some standard classes like clear sky, overcast can be used to define the forecast of sky coverage. The information of prevailing clouds is also important. In order to make the information more useful, probabilistic approach can be adopted. . The two most difficult forecasted variables are snow and rainfall. The crop water needs are met by the fog which can be measured by the rain gauge. The fog at the airports are predicted by the nomograms. At daytime, nocturnal times the crop species exhibit a phenomenon known as Thermoperiodicity. The data of maximum and minimum temperatures is used to derive mean day and night temperatures. Relative humidity is better understood by the users than the other measures like vapour pressure.

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