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Perspective

Traditional Weather Forecasting and Climate Change Adaption

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DESCRIPTION

Atmospheric conditions of a particular place can be found through weather conditions. Actual climatic conditions can be known for a certain time period that how weather will be and it can be known through objective data using meteorology. Seasons and nature play a major role in agriculture and farming. It is different from region to region. In agriculture, prior information about weather helps farmers to take essential decisions to improve their crop yields. Airport or naval systems require continuous weather data to know if there is a sudden change in climatic conditions. Accurate wind velocity prediction is critical for wind farms to control the working of wind turbine during wind power generation. Mining industries require precise weather information to monitor the Earth's crust continually. Weather forecasting on a daily, weekly, monthly or yearly basis will become essential as it can better reflect the changing fashion of weather and additionally provide timely and efficient environmental information for the decisions at the micro-management level.

Weather forecasting has now entered the era of big data because of the advancement of climate observing systems like satellite meteorological observation and also because of the fast boom in the volume of weather data. Traditional computational intelligence models are not adequate to predict the weather accurately. Moreover, with the advancement of deep learning techniques and appropriate data visualization methods, weather forecasting and climate prediction can be made more effectively and accurately. Hence it is reasonable to use deep learning strategies to process massive datasets that can learn and make predictions more effectively based on past data. Deep learning techniques use layers of neural networks to identify and extractmeaningful patterns from the datasets. A neural network with deep architectures can extract high-level abstract features of big data accurately. The effective implementation of deep learning in various domains has motivated its use in weather forecasting and is a significant improvement for the weather industry. The deep learning architectures like Recurrent Neural Networks and Long short term memory networks are proved to be reliable models for weather forecasting tasks.

Forecasting models can be classified as temperature prediction models, wind speed prediction models, rainfall prediction models, dew point prediction models, and so on depending upon the parameter to be predicted. Each prediction model forecasts a particular parameter based on previous observations. Temperature forecasting models aim at predicting the minimum, maximum or average temperature of a location, based on various weather parameters. The maximum temperature forecast depends on sunshine during day time, whereas the minimum temperature forecast relies on cloud conditions at night.

CONCLUSION

Temperature prediction plays an essential role in agriculture. Prior information about weather helps farmers to take important decisions to enrich their crop cultivation. The extreme temperature will cause severe damages to plants and animals, and it is always a great concern for farmers. The temperature should be optimal for the growth of plants. Low temperatures may cause injury to crops. So, the prediction based on temperature is essential in agriculture. Likewise, wind speed prediction models are intended for forecasting wind speed. Wind speed prediction is an important activity as the wind has applications in various domains which include power generation, agriculture, industry, naval systems and the marine world.

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