Infogain attribute evaluator and ANN based wind speed prediction model for rajasthan, north-west region of India

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The installation of wind turbine in a particular location in India is based on the wind speed prediction. The wind speed can be predicted using different models. The average temperature, maximum temperature, minimum temperature, ambient temperature, dew-point temperature, air pressure, vapor pressure, atmospheric pressure, solar radiation, altitude, longitude, wind direction, mean sea level, relative humidity, time of the day, water vapor, wind power are input variables to the Artificial Neural Network (ANN) which affects the accuracy of the wind speed prediction. Therefore, the selection of the most relevant input variables to the ANN model is necessary. With this main objective, InfoGain Attribute Evaluator with Ranker Search Method is applied to find the most relevant input variables. Identified relevant input variables are used as input for ANN Model to predict the wind speed. The results obtained validates that the combination of input variables selected through InfoGain Attribute Evaluator gives higher prediction accuracy than any other combination of input variables. This method is used to predict the wind speed in Rajasthan, north-west region of India.

The MATLAB based graphical results are shown in Figure 1 to 3, which are used to further validation of the proposed model.

Figure 1: Regression plot of (a) training, (b) testing, (c) validation, (d) over all regression of the model

Figure 2: Error Histogram plot

Figure 3: Performance plot

References

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