Abstract

The monsoon rainfall has very important affect on the agricultural production, livestock as well as human ecology. In this study, try to fit Artificial Neural Network (ANN) model to predict average monsoon rainfall. For the ANN models monthly average rainfall, sea surface temperature, wind speed, monsoon rainfall, temperature is used as inputs to predict the monsoon rainfall. The feed forward network was trained using a variety of algorithms. For the different networks use sigmoid transfer function, tan sigmoid transfer function and linear transfer function. The total sample was divided into a training set (first 75 percent) and a testing set (last 25 percent). The data pertaining to the years 1961 to 2005 have been explored to develop the predictive models. The model performance is measured by prediction error, mean square error, root mean square error, correlation, similarity, mean percentage error and mean absolute percentage error. Finally, the prediction performance of artificial neural network has compared with polynomial curve fitting, Fourier series, auto regressive moving average model (ARMA), and multiple linear regressions. The average monsoon rainfall prediction based on Artificial Neural Network was found to be superior to that based on polynomial curve fitting, multiple
linear regression, ARMA model and Fourier series. Finally, made cluster analysis between actual average monsoon rainfall and predicted average monsoon rainfall by different ANN and other statistical models. From the dendrogram, it is evident that the actual monsoon rainfall and predicted rainfall by ANN fall in one cluster. The ANN model gives more accurate prediction compared to other models.

References


Index Terms

Computer Science

Artificial Intelligence

Keywords

Artificial Neural Networks, Similarity, Cluster analysis, Activation function, Prediction.