Artificial Neural Network Model for the Prediction of Thunderstorms over Kolkata

Volume 50 - Number 11
Year of Publication: 2012

Authors:
Litta A. J
Sumam Mary Idicula
C. Naveen Francis

Abstract

Severe thunderstorms frequently occur over the eastern and north-eastern states of India during the pre-monsoon season (March-May). Forecasting thunderstorm is one of the most difficult tasks in weather prediction, due to their rather small spatial and temporal extension and the inherent non-linearity of their dynamics and physics. In this paper, experiments are conducted on artificial neural network (ANN) model to predict severe thunderstorms that occurred over Kolkata on 3 May 2009, 11 May 2009 and 15 May 2009 using thunderstorm affected parameters and validated the model results with observation. The performance of ANN model in predicting hourly surface temperature during thunderstorm days using different learning algorithms are evaluated. A statistical analysis based on mean absolute error, root mean square error, correlation coefficient and percentage of correctness is performed to compare the predicted and observed data. The results show that the ANN model with Levenberg Marquardt algorithm predicted the thunderstorm activities well in terms of sudden fall of temperature and intensity as compared to other learning algorithms.
ences

- M Mohan Raju, R K Srivastava, Dinesh C S Bisht, H C Sharma and Anil Kumar, 2011.
Artificial Neural Network Model for the Prediction of Thunderstorms over Kolkata

"Development of Artificial Neural-Network-Based Models for the Simulation of Spring Discharge," Advances in Artificial Intelligence Volume 2011, Article ID 686258.


Index Terms

Computer Science

Artificial Intelligence

Keywords

Artificial neural networks  learning algorithms  thunderstorm  temperature
Levenberg Marquardt