

A New Deep Intuitionistic Fuzzy Time Series Forecasting Method

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Abstract

Forecasting methods based on intuitionistic fuzzy sets are popular in fuzzy research communities. The intuitionistic fuzzy inference systems employ membership and non-membership values in the modelling of time series. In this study, a new intuitionistic fuzzy time series is introduced. The proposed method uses intuitionistic fuzzy c-means clustering algorithm to create intuitionistic fuzzy time series. Simple deep recurrent neural networks are employed for the modelling of intuitionistic fuzzy time series. The training of the deep recurrent neural network is made by using a modified particle swarm optimization. The performance of proposed method is investigated by using maximum and minimum temperature time series in Giresun, Turkey. The performance of the new method is compared with forecasts of “Turkish State Meteorological Service”, machine learning and classical methods.

Keywords

Intuitionistic fuzzy sets, Deep learning, Particle swarm optimization, Intuitionistic fuzzy time series, Recurrent neural networks.

References

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