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A hybrid fuzzy time series forecasting model based on granular computing and bio-inspired optimization approaches

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Abstract

In this article, a novel M-factors fuzzy time series (FTS) forecasting model is presented, which relies upon on the hybridization of two procedures, viz., granular computing and bio-inspired computing. In this investigation, granular computing is utilized to discretize M-factors time series data set to obtain granular intervals. These intervals are additionally used to fuzzify the time series data set. Based on fuzzified time series data set, M-factors fuzzy relations are set-up. These M-factors fuzzy relations are further utilized to acquire forecasting results. Moreover, a novel bio-inspired algorithm is proposed to enhance the forecasting accuracy. The main objective of this algorithm is to adjust the lengths of the intervals (granular and non-granular intervals) in the universe of discourse that are used in forecasting. The proposed model is verified and validated with various real world data sets. Vari-

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