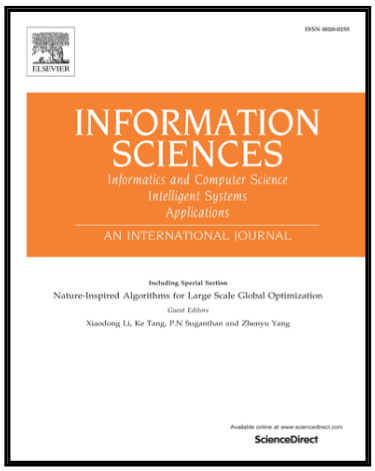

Fuzzy forecasting based on two-factors second-order fuzzy-trend logical relationship groups, similarity measures and PSO techniques

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Fuzzy forecasting based on two-factors second-order fuzzy-trend logical relationship groups, similarity measures and PSO techniques

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Abstract

In this paper, we propose a new fuzzy forecasting method based on two-factors second-order fuzzy-trend logical relationship groups (TSFTLRGs), particle swarm optimization (PSO) techniques and similarity measures between the subscripts of fuzzy sets (FSs) for forecasting the Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX) and the New Taiwan Dollar/US Dollar (NTD/USD) exchange rates. First, we propose a PSO-based optimal-intervals partition algorithm to get the optimal partition of the intervals in the universe of discourse (UOD) of the main factor TAIEX and to get the optimal partition of the intervals in the UOD of the secondary factor SF, where $SF \in \{\text{Dow Jones, NASDAQ, M1B}\}$. Based on the proposed PSO-based optimal-intervals partition algorithm, the constructed TSFTLRGs, and similarity measures between the subscripts of FSs, we propose a new method for forecasting the TAIEX and the NTD/USD exchange rates. The main contribution of this paper is that we propose a new fuzzy forecasting method based on TSFTLRGs, PSO techniques and similarity measures between the subscripts of FSs for forecasting the TAIEX and the