СЕКЦІЯ XII. АВТОМАТИЗАЦІЯ ТА ПРИЛАДОБУДУВАННЯ

AUTOMATION THE PROCESSES OF PATTERN RECOGNITION

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Time series modelling is a dynamic field of research that has attracted the attention of scientists over the past decades, the main goal of researchers is to carefully collect. The studying past observations of time series to develop a suitable model that describes the structure inherent in the to develop an appropriate model that describes the inherent structure of the the time series. This model is then used to generate future data for the series, i.e. forecasting. Thus, time series forecasting can be described as the act of predicting the future by understanding the past.

The proposed method involves the use of a combination of random processes, Markov chains, statistics econometrics and nonlinear optimisation methods to build a model for forecasting time-series returns. The specific steps of the method include: using the theory of random processes and high-order Markov chains; use the theory of random processes and high-order Markov chains to build a time series model; use of statistics and econometrics to select a set of lagged variables that affect the forecast indicators variables that affect the forecast indicators and estimate the probability matrices of transitions between states; use of nonlinear optimisation methods to build a nonlinear trend model with harmonic components for forecasting low-frequency forecasting the low-frequency component of a time series.

The difference series is statistically analysed to identify the frequency of occurrence of each of the eight series highlighted above. On its basis, taking into account the type of the last series and the possible following scenarios of the system behaviour, the forecast is built:

$$x \times n + 1 = x_n + p_i \times \Delta i + p_d \times \Delta d \qquad (1)$$

where, p_i is the probability of future growth, determined by the type of the last series, p_d is the probability of decline, Δi is the average value of growth, Δd is the average value of decline.

Neural networks allow approximating any continuous function with any accuracy, despite the absence or presence of periodicity and cyclicity, that is, a neural network can be "taught" in such a way that it recognises any data set with high certainty and determines the further development of the studied process in agricultural production for a certain period of time. A neural network forecasting model is able not only to continuously process a large number of system parameters and predictive background factors but also to take into account heterogeneous information about the current and planned operating modes of objects and production processes [2]. A neural network forecasting system, in turn, takes

into account information about the logic of the system, the reliability of its elements, as well as expert information. The ability of a neural network to work on the "black box" principle in many cases facilitates modelling agricultural production management systems. You just need to decide what your input source data are, systematise them and train your neural network.

Список використаних джерел:

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2. Mathematical modeling of the dynamics of homogeneous reactions in the cascade of perfect mixing reactors Prymyska, S., Beznosyk, Y., Reschetilowski, W. Eastern-European Journal of Enterprise TechnologiesThis link is disabled., 2017, 2(6-86), pp. 27–32.