CONTENTS & ABSTRACTS

The problem of nonstationary relay system analysis and synthesis is considered. The paper shows the opportunity of finding the design parameters under which the motion of the system described by a reduced mathematical model is asymptotically globally stable. For a special case, it is proved that the motion of the system described by the complete model converges to some domain that includes the desirable motion. Convergence domain construction technique is offered.

Direct synthesis procedures for stand-alone control of end effector arm's position are offered. A method of prelimit control hierarchy is developed ensuring the desirable tracking accuracy under the uncertainty of control object's operator and uncontrolled external disturbances. The dataware problem is solved by choosing zero-overshoot response-based state observer that allows to get the estimates of non-measurable variables and existing uncertainties in theoretically finite time.

The paper discusses problem of economic growth in Russia and the economic policy stimulating the growth. It demonstrates the structural paradox of Russian economy and discusses some aspects limiting the economic growth. The analysis is undertaken that makes it possible to allow for institutional, demographical, and environmental factors of economic system's development and to make the policy of growth stimulation more effective.

The problems of calculating an integrated estimate of demographic development level in a municipal unit and of demographic data interpretation are discussed. The design of a functional parameter network with various kinds of dependences such as rules-productions, formulae, and fuzzification procedures is applied as a methodological basis. The methods described can be used by the authorities of Russian Federation subjects or by local governments for complex socio-economic planning.

The paper discusses the methods for multi-parameter continuous scales debugging intended for making agreed decisions in multi-objective planning based on expert knowledge. The examples of scale verification and testing procedures are adduced.

A new approach to SAT problems solution based on large-block parallelism concept incident to many high dimensionality problems is proposed. In this framework, the decomposition of the initial conjuctive normal form (CNF) to a CNF family is built with subsequent SAT problem solution for each CNF of the family on each computational node of the cluster. The planning of the optimal computation is done by optimizing a special predictive function. The efficiency of the approach is proved by solving cryptanalysis problems for summing and threshold generators.

Several algorithms providing the assignment of a real-time task's parameters for fixed priority scheduling under any linear interval constraints are proposed. The paper shows that the algorithms proposed enable the scheduling efficiency improvement and hence higher quality control realization for the given computational resources.

The paper discusses optimal control problem for a telecommunications network. A transportation network model is built. Two solution algorithms are proposed. Test problems are solved, and model adequacy is verified.

A computerized system for medical statistics information acquisition and at the municipal level is presented. The system employs diverse techniques for data analysis, overall indices processing, clustering, prediction, and artificial intelligence. It enables the multidimensional analysis of sickness rate indices at various management levels based on national medical statistics.