CONTENTS & ABSTRACTS

Gusev V.B.

The survey of the problem of development and application of autonomous control models in the developing systems is presented. The formalized description of the class of the developing systems autonomous control models with reproduction is proposed. The combination concept of the mechanisms of indicative planning and regulation under the conditions of technological and information constraints is briefly described. Problematic issues are formulated, and recommendations for constructing the autonomous control systems under the conditions of instability and external disturbances, based on the examples of indicative planning and of regional development management are given.

Keywords: models, developing system, autonomous control, indicative planning, regulation, technological and information limitations.

Sidelnikov Yu.V., Ryabukhin A.V.

The basic concepts and basic hypotheses of research in the field of improving the efficiency of meetings in small groups are considered. The review is given of the decision-making models in enterprises and organizations, of the main types of meetings held by a small group of specialists, of the main approaches to the problem of improving the efficiency of meetings.

Keywords: meeting, efficiency of the meeting, identification, meeting procedure.

Granin S.S., Mandel A.S.

An inventory management problem is considered, related to the optimization of the processes emerging in a supply chain in presence of several alternative suppliers with different reliability and econometrical characteristics. Two cases are investigated: (a) the delivery costs share is fixed and the same for all the suppliers while the costs per unit of goods are different, and (b) all cost components are different for different suppliers. Algorithms of constructing the optimal strategies of the inventory management and of the suppliers selection are proposed for case (a). For case (b), the general plan is built of forming the optimal strategies. The results of the numerical modelling are given.

Keywords: inventory management, supply chains, alternative suppliers, dynamic programming.

Blumin S.L., Borovkova G.S.

The method of organizational systems control is suggested, focused on increasing the efficiency of socio-economic indicators, wherein the method of reverse computations is used as a means of finding the factors values to achieve the desired indicator value, and which anticipates the analysis of finite fluctuations as a method of assessing the impact found. The work of the new method is illustrated, the analysis and the comparison are conducted of the two theorems of the analysis of finite fluctuations, that are applicable within the framework of the method developed.

Keywords: analysis of finite fluctuations, Lagrange's theorem, second mean-value theorem, method of reverse calculations.

Sirotyuk V.O.

The requirements to the structure and completeness of the patent information fund are formulated. The definition of the completeness indicator of the fund is given, and formalized models and methods for its analysis and evaluation are proposed. The results obtained were used in assessing the completeness and improving of databases of the patent information fund of the international patented organization — the Eurasian Patent Office.

Keywords: patent information fund, patent search of an international type, database of patent and non-patent information, thematic database, indicator of completeness of the patent information fund, a master database of patent and non-patent information.

Shalaginova Z.I.

The mathematical model is given of a heat-supply system (HSS) thermal-hydraulic operation modes over time, taking into account the transport delay, as well as disturbing and control actions. Indices of provision sufficiency for customers have been developed, integrated with respect to calculation time period based on the simulation modeling of thermal-hydraulic operation modes. An approach to the problem of arranging intermediate stages of regulation is proposed, based on constructing the matrices of paths starting at the end-user's points and directed opposite to the heat carrier flow.

Keywords: heat supply system, multi-level modeling, intermediate control stage, regime controllability index, synthesis, methodology, algorithm, calculation, information computational complex.

Tsodikov Yu.M.

The problem of the optimal planning of oil refineries production is formulated in the form that provides for solving it using the successive linear programming (SLP) method. The factors affecting the convergence of this method while solving nonlinear problems of large dimensionality are considered. The example of a nonlinear model is given. The influence of the accuracy of the solution is investigated, and recommendations are given for improving the convergence for complex models.

Keywords: optimal planning, successive linear programming, nonlinear programming, multi-period planning.

Pshikhopov V.Kh., Medvedev M.Yu.

The algorithms of model reference parametric adaptation are considered, providing the astaticism and disturbances estimation. The structure of the control system is suggested allowing to design multivariable controllers providing the movement along the specified trajectories for an object described by kinematics and dynamics of mechanical systems in three-dimensional space. The asymptotic stability of a closed-loop adaptive system including a loop to provide astaticism is proved by the method of Lyapunov functions. The errors analysis is carried out of disturbances estimation by asymptotic observer. The boundaries of the estimation error are shown, and the relations are given to adjust the observer parameters. The results of the numerical investigations are given.

Keywords: adaptive control, reference model, path control, astaticism, asymptotic estimator, multi-loop adaptation, parametric adaptation.

Sokolov S.V., Sakharova L.V., Manin A.A.

The problem is solved of the stochastic control of the moving object maneuvering to minimize the probability for it to get into a coverage area of measuring devices of a group of mobile tracking units, keeping the track of it. The moving object control is realized based on a posteriori estimates of both the vector of its own state as well as the vectors of the state of the group of mobile tracking units, obtained from the readings of the measuring instruments located directly on an object board. An example is given illustrating the effectiveness of the approach proposed.

Keywords: mobile object, group of mobile tracking units, a posteriori estimation, stochastic control, probability of existence of the state vector.

Chadaev A.I., Tropova E.I.

Possible algorithms of forecasting the lateral blocks to run out of fuel are considered related to the functioning of the multi-block first stage of launch vehicle «Soyuz-2». The results of the comparative analysis of accuracy characteristics of the work of the forecasting algorithms considered are given for certain emergency situations.

Keywords: launch vehicle, fuel use forecasting system, control algorithm, emergency situations.