



CONTENTS & ABSTRACTS

AN ADAPTIVE CONTROL SYSTEM FOR T -PERIODIC NONLINEAR PLANTS 2

Yeremin E. L., Kapitonova M. S.

An adaptive control system for nonlinear periodic scalar plants is synthesized with the help of an implicit reference model and a synthesis method based on hyperstability criterion application. The structure of self-tuning loops for adaptive controller's coefficients is formed using both periodic and integrating blocks.

CONTROLLING AN OBJECT WITH A PRIORI UNDEFINED STATE VECTOR STRUCTURE 8

Pogorelov V. A.

The paper presents a technique enabling precise synthesis of control laws for a stochastic object with undefined state vector structure. The control laws synthesized are optimal subject to nonlinear probability criteria. The advantages of the new technique as against the control based on precise identification of state vector's structure during object's motion are demonstrated. An application example is included.

STRUCTURALLY EQUIVALENT FUNCTIONS IN DISCRETE OPTIMIZATION TASKS 13

Burkov V. N., Burkova I. V., Kolesnikov P. A., Kashenkov A. R.

Network programming techniques is generalized for the case where both the objective function and the constraints have similar network structures. Several discrete optimization cases are studied.

A MODEL OF AN ANALOGY BETWEEN MATHEMATICAL PROOFS 20

Kleschev A. S.

A model of an analogy between proofs is built on the basis of an extendable model of mathematical practice. A source proof is generalized by replacing some its parts with global syntactic variables. The target proof is obtained from the generalization as the result of applying a syntactic substitution instead of global syntactic variables. The tasks of analogy discovery, of building a target proof by analogy, of lemmas generation, which are necessary for building a target proof by analogy as well as for the generation of theorems analogous to a source one, consist in searching such syntactic substitution.

INTELLIGENT MECHANISMS OF INFORMATION WARS 25

Tsyganov V. V., Bukharin S. N., Vasin V. V.

The paper discusses information war mechanisms providing flexible interaction between the propaganda and the persons concerned in the struggle for rivals suppression and capturing their capital and power. An intelligent propaganda mechanism is developed enabling rival suppression in the presence of a complex teachable control subject — a group comprised of an agent of influence and the concerned persons minimizing their risks. Prop-

aganda mechanisms ensuring information dissemination among groups and co-operation of the concerned persons in the organization are considered. A mechanism of informational resistance regulating the interaction of propaganda structures with the persons concerned in the competitive activity for the influence within the organization is developed.

SCENARIO PLANNING AS A TOOL FOR SOLVING ECONOMIC MANAGEMENT PROBLEMS 31

Kononenko A. F., Shevchenko V. V.

A class of a game-theoretical models (operational games) is briefly described enabling effective application of scenario planning. The principles and procedures of its application to gaming simulation of socio-economic processes are discussed. A basic macroeconomic model describing socio-economic development of a of state is offered.

A FINANCIAL PREDICTION MODEL AND HOME INVESTMENT SCENARIOS 37

Dranko O. I.

A mathematical model of financial accounting is presented that enables quick assessment of enterprise's future financial performance and pressure for money (financing requirement). Business efficiency management scenarios are discussed. The indicators calculated on the basis of public accounting data are used as control variables. The results of enterprise operation efficiency improvement in various industries are included.

COMPANY VALUE MANAGEMENT PROBLEM: A DISCRETE CASE 41

Romanov V. S.

The paper describes a mathematical model of company value management from evaluation to calculation of specific projects' influences on the company value. A value maximization problem has been formulated on the basis of the management model. The problem has been analyzed for a discrete case. The paper shows that the common «cost/performance» technique would not deliver correct solutions due to the impossibility to divide the projects and because of synergetic effects between them. Three heuristics (analogs of PI , NPV and IRR criteria) were offered as a means to find solutions. The possibility of their application has been analyzed by means of a numerical experiment.

IDENTIFICATION OF STATISTICAL PROCESS MODELS UNDER INCOMPLETE INFORMATION. 46

Kuznetsov L. A., Korneev A. M., Zhuravlyova M. G.

The possibility of EM algorithm strategy application for building multiple regression models under incomplete process data is examined. The models based on complete data and the data where the missing points were replaced with unconditional and conditional means are compared. An enhanced model describing the relationship between a mechanical characteristic of flat and a set of process parameters is obtained with the help of EM algorithm.

**THE PROBLEMS OF ENERGY-EFFICIENT CONTROL OF A SHEET-ROLLING COMPLEX. Part II51****Ghenkin A. L., Kudelin A. R.**

The principles of initial tuning of energy-efficient control system for sheet-rolling «furnaces—flating-mill» complex and its further adjustment are developed. The system's efficiency for various energy conservation modes is evaluated.

THE AUTOMATED SYSTEM FOR EARLY AND DIFFERENTIAL DIAGNOSTICS OF THE CLINICAL FORMS OF PARKINSON'S DISEASE58**Khutorskaya O. E.**

A system operating on the basis of spectral-statistical treatment of a special signal extracted from the electromyogram (EMG) is described. Quantitative estimates of various EMG parameters underlying the diagnostics are derived. The automated system is applied for statistical treatment of quantitative estimates of various EMG parameters and determination of basic symptomatology of Parkinson's disease.

AN INERTIAL-SATELLITE NAVIGATION CONTROL SYSTEM FOR VEHICLES64**Makarenko V. G., Podorozhnyak A. A., Rudakov S. V., Bogomolov A. V.**

The paper provides theoretical justification of an inertial-satellite navigation control system for vehicles and proves its expediency with simulation results. Along with GPS signals, the system employs a variable dimension inertial strapdown system.

BIFURCATIONAL CHANGES OF POWER COMPANY MANAGEMENT ADEQUACY IN PROCESS OF REFORMS 72**Kleparsky V. G., Kleparskaya E. V.**

The changes in the adequacy of management realized in Russian power companies in process of their transition to free market are examined. A bifurcational change of the standard deviation from the central line of the attraction zone formed by the competitive milieu is detected. Its cause is the qualitative change of management.

A WHOLESALE POWER MARKET MODEL IN POWER COMPANIES' OPERATIONS PLANNING UNDER POWER INDUSTRY REORGANIZATION CONDITIONS 74**Ovsyannikova G. V.**

The necessity of improving power company's pricing procedures under power industry reorganization conditions is demonstrated. The paper suggests to use a wholesale power market model for power company activities planning.

DEVELOPING MECHANISMS FOR OBTAINING FUNDS FOR CULTURAL, SOCIAL, AND EDUCATIONAL PROGRAMS 76**Gladkov M. Yu.**

The paper focuses on the development of endowment and improving its efficiency in cultural, social, and educational programs.