CONTENTS & ABSTRACTS

Alexandrov A.G., Orlov Yu.F.

New algorithm of the finite—frequency identification of linear stable plant when the external disturbance is an unknown-but- bounded function is proposed. It allows to enhance identification accuracy. The algorithm convergence is proved.

Keywords: identification, linear system, frequency approach, unknown-but-bounded disturbance.

Zhukov V.P.

The conditions under which the stability type of the equilibrium state of a Lyapunov-type random-order non-autonomous nonlinear dynamic system would not change under any relatively small linear or nonlinear perturbances of its right-hand member (roughness in the sense of stability type conservation) are considered. Nonlinear components of right-hand members of unperturbated system and nonlinear perturbances of those right-hand members are considered to belong to a wide class of nonlinear functions depending in general case not just on the phase variable but also on time. This class contains both analytic functions and various types of nonanalytic functions. Sufficient roughness conditions are derived.

Keywords: nonlinear dynamic system, roughness in the sense of stability type conservation.

Hodashinsky I.A.

The paper considers three basic phases of fuzzy systems construction: expert evaluation, structure identification, parameter estimation. Expert evaluation includes: selection of fuzzy model type; choice of t-normal functions to set the fuzzy logic operations; choice of a fuzzy logic inference. For structure identification the fuzzy clustering method and iterative algorithm are offered. For parameters optimization the following methods have been chosen: genetic algorithm, ant colony algorithm, particle swarm optimization, simulated annealing.

Keywords: fuzzy system identification, metaheuristics, simulated annealing, genetic algorithm, ant colony algorithm, particle swarm techniques.

Zolotova T.V.

The model of branch corporation control with restriction on scarce and natural resources is presented. The model describes the two-level hierarchical control system. The positive effect of corporation activity with ideal coordination of participants' (the operating company, the enterprises) interests is considered. Different variants of model are considered: with additional restriction on admissible level of environmental pollution; with quotas; and with system of penalties for excess of admissible level of pollution.

Keywords: corporation, ideal coordination, profit maximization, settlement prices, tariffs on scarce and natural resources, quotas, penalty.

Mikhnenko P.A.

Adaptation to changing external factors is a condition of successful work of any modern economic organization. In feedback organizational systems the intensity of organizational transformations depends on statistic characteristics of the environment factors and intensity of information uncertainty. Increase of uncertainty of environment involves either the necessity of decrease of transformations intensity or implementation of strategy of anticipatory adaptation.

Keywords: economic organization, adaptation, uncertainty, mathematical model, stochastic characteristics, intensity of transformations.

Dyomkin I.V., Pertsev D.V.

On the basis of preconditions, studied in the first part of the paper, authors offer the original approach to solving the problem of integrated risk estimation. Moreover, the paper proposes new method of project portfolio integrated risk estimation with allowance for synergy and cannibalization effects.

Keywords: portfolio, innovative project, model, synergy, cannibalization, risk.

Andrienko A.Ya., Losev G.P., Tropova E.I.

The paper gives recommendations on perfection of operation algorithms of flow-measuring contours of a propellant-consumption control system of the launch vehicle «Sojuz-2», providing suppression of residual occurrences of self-oscillations in operation of these contours.

Keywords: self-oscillations, flow-measuring contour, fuel consumption control system, launch vehicle.

Dorri M.Kh., Roschin A.A.

The features of Software Tool RDS (Research of Dynamic Systems) are considered. It simplifies the development of research desks that are used for simulation and design of control systems for multi-purpose objects. RDS helps to synthesize algorithms of control and investigate the interaction between subsystems during dynamic processes.

Keywords: software tool, simulation, algorithms of control.

Nikolaychuk O.A.

The models of knowledge representation are developed and the further application of these models for solution of problems of genesis, forecasting and decision-making during the process of investigation of unique objects technical state dynamics is shown. As a result of a combination of case, production, and mathematical approaches, the hybrid model of knowledge representation, developed with an allowance for restrictions imposed by problem and subject areas is achieved. The algorithm of knowledge processing which uses the given hybrid representation is offered.

Keywords: models of knowledge representation, precedent, production, knowledge processing, unique mechanical system.

Saakian A.A.

The paper considers the problem of selection of appropriate quality measures for characterizing the efficiency of complex system that is investigated experimentally. The paper considers one kind of such systems — speech recognition systems and suggests the requirements for quality measures for speech systems. The paper also describes the principles of experimental investigation of quality measures and the results of experiments that allow selecting the best quality measure from the given set.

Keywords: speech recognition, recognition algorithm, quality coefficient, quality measurement.

Agaronyan O.S.

The problem of the hierarchical segmentation of an image based on irregular pyramid is considered. An adaptive approach using Voronoi diagram and Delaunay graph is proposed for image modeling. To derive many segmentations at different resolutions an iterative procedure is presented.

Keywords: hierarchical image model, irregular pyramid, image segmentation, mosaic tessellation, Voronoi diagram, Delaunay graph.