CONTENTS & ABSTRACTS

V.V. Petruschenko

The paper considers the classical Data Envelopment Analysis (DEA) model which is widely applied to efficiency evaluation in a great range of economic branches. Domains of applicability of the model are analyzed. The influence of heterogeneity of the evaluated sample on efficiency values, obtained with the use of DEA is studied. The detailed survey of the models used in case of heterogeneous sample is given.

Keywords: efficiency evaluation, Data Envelopment Analysis, heterogeneity of the sample.

A.A. Chentsov, A.G. Chentsov, P.A. Chentsov

The paper considers the routing problem of visiting megalopolises, that is complicated by constraints in the form of precedence conditions and work within megalopolises; it is assumed that the cost function may depend on the job list. It is noted that the application of the theory may be associated with the task of disassembly the decommissioned nuclear plant. In this problem, the cost of moving depends on the list of outstanding tasks: not removed pieces of equipment emit. It is shown that the computational difficulty of the constructed algorithms requires the use of parallel structure elements.

Keywords: dynamic programming, route, precedence conditions.

A.A. Shilin, V.G. Bukreev

The paper proposes the method of reconfiguring the sliding trajectory parameter in relay control of nonlinear object. Authors show the unique dependence of this parameter on the initial position of the control object on the phase plane for the two methods of synthesis: the first one optimally ensures the domain of attractione, the second one satisfies the conditions of optimal speed control using the maximum principle.

Keywords: nonlinear object, relay control, sliding path.

A.A. Ahohov, N.O. Bludian, J.A. Dorofeyuk, A.L. Cherniavsky

The approach to developing inter-regional bus transportation management system is considered on the basis of collective examination methodology. Independent multiple-choice examination (IMCE) method which takes into account the specificity of the task is proposed. The developed IMCE method includes six main stages: creating the list of candidates, creating a list of relatively independent problems, potential experts competence assessment, expert commissions formation, work of expert commissions (cross-examination is the main procedure for that), the decision draft formation and its transfer to decision-maker. The paper presents the preliminary results of IMCE method application to inter-regional bus services market regulation problem (between the North Caucasian Federal district and Moscow).

Keywords: inter-regional bus transportation, organizational management, market regulation, collective multiple-choice examination.

G.G. Stetsyura

The fast mechanisms for interaction of active objects of digital systems are proposed. Their applicability for providing the fast reaction of complex digital systems on the change of the system and environment and fast distributed calculations is shown. The ways of creation of technical devices necessary for realization of the proposed mechanisms are shown.

Keywords: active object, distributed switching, synchronization, distributed calculations, active messages.

S.V. Zykin, A.N. Poluyanov

The problem of automation of formation of multidimensional data tables from a source relational database with undefined scheme is considered. For formation of dimensions of such tables the use of data presentations earlier generated by the system is proposed. The opportunity of reuse of representations is defined by calculation of truth domains of logic expressions.

Keywords: multidimension table, relational database, domain.

N.A. Babushkina

The paper presents the mathematical model of antitumoral treatment using the virus-derived vaccine. The model describes two stages of tumor cells death caused by immune response to the virus and the subsequent immune response to the dead infected tumor cells. The parameters of the mathematical model are defined and validated using experimental tumor cells growth curves. Inverse problem method is used to estimate the parameters of the model. The model allows estimating the initial dose of vaccine preparation which acts as a controlling parameter of antitumoral effect. This mathematical model describes the mechanism of antitumoral effect of the virus-derived vaccines within the framework of interaction between tumor, virus, and immune system.

Keywords: mathematical model, tumor cells, controlling dose effect, immune response, virus, vaccine therapy.

M.E. Shaikin

The problem of ensuring secrecy of maritime mobile object in a threat environment is considered. The problem of navigating between initial and final points to maximize the probability of threat avoidance for the object is considered. Specifically, optimization of traffic is carried out by selecting the trajectory on which the probability of detection is minimized. Different aspects of detection of a moving object and the algorithms for calculating the probability of detection on the specified path are discussed.

Keywords: threat environment, path planning, moving target, risk of detection, false alarm and detection probabilities, sequential analysis, optimal decision.