# CONTENTS & ABSTRACTS

SINGULAR ISSUES OF CONTROL SYSTEMS DESIGN FOR
**Bunich A.L.**

The issue of many-inputs-many-outputs systems design for the linear discrete plants with the stationary singular noise is considered. This issue is shown to be degenerative. The method of controller design is presented.

**Keywords:** singular control issue, linear discrete plants, zero price of control.

COMPOSITION OF REGULATORS OF GIVEN STRUCTURE
**Scherbakov P.S.**

This paper analyzes and extends the simple and efficient low-order controller design method proposed by O.N. Kiselev and B.T. Polyak in 1999 as applied to the stabilization of normal operating conditions of electric power systems. Within this approach, the complete set of feasible regulators of given structure is composed (or generated in a random way) and a desired controller is then chosen according to one or another performance index formulated in engineering terms. A robust version of the method is also analyzed and a generalization to higher-order controllers is discussed.

**Keywords:** fixed-order controllers, *D*-decomposition, robustness, randomization.

ON THE REASONS OF REGIONAL
**Bukharin S.N.**

As a rule at present the problems of ecological safety become the cause for infowars. The purpose of these wars is to capture the power and resources. A vivid example of similar wars is the struggle for control over the financial streams directed to regions for realization of large-scale investment projects. The paper gives a solution of academician N.N. Moiseyev problem (which is connected with the present problem) for modern conditions when except the interests of the federal centre the region interests are also considered.

**Keywords:** environmental contamination, output volume, penalty, region development, local administration, federal centre, compromise.

**Popov E.V., Shmatov G.A.**

The theory of calculation of a target audience reach depending on the number of appearances in the media has been developed. The theory enables to determine the value of total and effective audience reach and to find out the reach distribution with respect to the contact number. The theory under discussion is the part of an analytical instrument which permits to make decisions concerning the advertising budget management and optimization of the advertising placement in media.

**Keywords:** advertising media planning, optimization, reach, advertising placement.

INFORMATIONAL INFLUENCE AND INFORMATION
**Gubanov D.A., Novikov D.A., Chkhartishvili A.G.**

Formation and dynamics of agents' opinions in the social network are modeled by Markov chain. Problems of agents' opinions control, as well as the game-theoretical models of informational confrontation, are formulated and solved for particular cases.

**Keywords:** social network, informational influence, information control, informational confrontation.

PRODUCTION MANAGEMENT ON THE TACTICAL LEVEL
OF PLANNING UNDER THE FUZZY INITIAL
**Fedoseev S.A., Vozhakov A.V., Gitman M.B.**

The paper considers a production scheduling model with fuzzy measures and constraints. The model is based on the fuzzy sets theory. As an example the actual production schedule of Zavod SDM, Ltd. (Perm city) is considered.

**Keywords:** production management, software, material requirements planning, fuzzy information.

**Bolodurina I.P., Lugovskova Ul.P.**

The paper presents the controllable model that allows to investigate human immunity mechanisms. The optimization problem described by a system of nonlinear differential equations with a retarded argument and discontinuous right side is set, and its solution algorithm is proposed. The algorithm allows to identify the characteristics of the flow and outcome of various forms of disease, to better understand the factors that determine the nature of the immune system response to various antigens, to find the optimal treatment program.

**Keywords:** immunity, immune system, mathematical model.

USE OF MOBILE CONTROL METHODS FOR OPTIMIZATION
OF TEMPERATURE REGIMES FOR PLAZMOTRON

**Kubyshkin V.A., Finyagina V.I.**

The practical problem of finding the optimal motion laws for heating spots for the class of systems with distributed parameters with mobile control action is solved. The discovered motion law ensures minimum of maximal average electrode temperature and hence the erosion value of electrode is decreased. Some mathematical models of temperature fields in plazmotrones are considered. For solution of optimization problem the methods of substitution and realization for systems with mobile control are used.

**Keywords**: mobile control, electro-arch plazmotrones, electrodes erosion, mathematical models of temperature fields, optimal law of heating spot scanning**.**

SEARCH OF MOVING TARGET BY ITS INFORMATIVE
CHARACTER «TRACE». PART 1. THE GENERAL STRUCTURE
**Abramyantz T.G., Belanov Yu.A., Maslov E.P., Yahno V.P**

Solution of a planar problem of pursuer trajectory optimization is presented. The trajectory contains two parts — one is the search of a moving object (target) by informative character «trace» and the other — overtaking the target after trace detection. Minimax solution is found for the case when the target chooses its motion direction from some angle range and moves along a straight line with a constant speed.

**Keywords:** «trace» of object, search trajectory optimization, minimax solution.

ESTIMATION OF COMPLEXITY OF MOVEMENT CONTROL

**Tverdohlebov V.A.**

The paper offers the estimation procedure of complexity of movement control along the given route with consideration of numerical indexes of control rules complexity on separate route sections; amount of control rule changes; and the length of route sections with the unchangeable control rules. Control rules are formalized in the form of recurrent formulas that define a route code. Numerical indexes of properties, performance and parameters of a route are systematized by means of the designed spectrum of parameters.

**Keywords:** complexity of movement control, route, object of movement, controls, code of route, geometrical properties of a route, recurrent form, control rule.

ON THE METHODOLOGICAL SUBSTANTIATION

**Alekseeva A.I.**

On the basis of activity structure model we increase the precision of definitions of concepts and categories of business analysis: object domain; object of the science, both fundamental and applied; subjects; means and objects of fundamental and applied research; objectives and results of economic activity, as well as the maintenance of direct and feedback relations between science, practice and the object of research — organization.

**Keywords:** methodology, business analysis, definition of object and subject, classification of structure of scientific and practical activity, connections with the organization.

SYSTEM IDENTIFICATION IS ON THE WAY TOWARDS
CREATION OF METHODOLOGICAL AND
LOGICAL-MATHEMATICAL GROUNDS FOR SCIENCE
INTENSIVE TECHNOLOGIES OF STRUCTURE