# CONTENTS & ABSTRACTS

**Kulchin Yu.N., Zakasovskaya E.V.**

The paper discusses tomography reconstruction of distributed physical field parameters by means of distributed fiber optical measuring systems for incomplete parallel schemes of measuring lines stacking. The presented approach consists in geometry optimization of a measuring network for the purpose of further application of neural networks complexes for direct restoration of physical fields' functions and for synthesis of projective data.

**Keywords:** distributed fiber-optic measuring system, schemes of measuring lines stacking, parallel beam tomography, radial basis function neural network.

**Abramov O.V.**

The problem of synthesis of analogue engineering systems which require adjustment elements for maintenance of specified indicators of performance and reliability is considered. The basic attention is given to a choice of set of parameters which are most expedient in regard to adjustment carried out.

**Keywords:** reliability, adjustment, parameter, optimization, algorithm, availability, engineering system.

**Klimchenko V.V.**

The paper considers the problem of controlling state of a technical system being exploited under conditions of deficiency of information about its stochastic properties. A one-parameter family of metrics for control criteria is proposed. The metrics' parameter may be chosen depending on the requirements to the system reliability. The approach proposed permits some deviations from the minimax one which is traditionally applied under conditions of information deficiency. This feature of proposed approach results in decreasing maintenance costs for a class of systems which failure will not cause catastrophic consequences.

**Keywords:** state control, metric space, fault rate.

**Digo G.B., Digo N.B.**

Calculating aspects of realization of multimethod computing technology as applied to problems of optimal parametrical synthesis are considered. Multimethod schemes of search of maximum of algorithmically given objective functions with nonlinear functions-constraints on parameters for methods of non-uniform coverings and the random search are described.

**Keywords:** multimethod technology, optimal parametrical synthesis, random search, non-uniform coverings, computation parallelizing.

**Kulinich A.A.**

The paper considers methods of influence analysis, structure analysis, inverse problem solving, and scenario analysis realized in cognitive map based modeling software designed for development of ill-structured situations control strategies.

**Keywords:** decision-making support, ill-structured situation, cognitive maps, control strategy, influence analysis, structure analysis, inverse problem, scenario analysis.

**Furtat I.B.**

The algorithm of robust synchronization of network on output of interconnected dynamical subsystems with a leading subsystem (leader) is proposed. A dynamic network with a variable structure is reviewed. The mathematical model of each subsystem of the network (except the leading subsystem) is described by a priori, parametrically, functionally and structurally uncertain nonlinear differential equations. The algorithm for decentralized control is obtained. It provides synchronization of network and compensates unknown disturbances with required accuracy.

**Keywords:** robust control, network synchronization, compensation of disturbances, observer of derivatives.

**Rouban A.I.**

The general schema for calculation of sensitivity coefficients (components of vector gradient from quality function to constant parameters) for multidimensional non-linear dynamic systems described by differential equations with delay time which have discontinuity of right members and phase coordinates, is constructed on the basis of variation method.

**Keywords:** sensitivity coefficient, variation method, conjugate equation, discontinuous dynamic system, delay time.

**Fedoseev S.A., Gitman M.B., Stolbov V.Yu.**

The paper considers one of the possible approaches to control the production quality at the manufacture planning stage. This approach takes into account more detailed level of customers' interests. Models for optimal portfolios formation that can incorporate their significance and composition MPS and operational planning of manufacture, while reducing risks of violating deadlines of production delivery, are proposed.

**Keywords:** production quality, quality management models, manufacture planning, discrete optimization problem.

**Loskutov A.I., Sirota S.V., Sakulin A.N.**

The paper offers a new approach to increasing a decision making effectiveness in the process of testing of missile and space technology objects. It is based on the use of artificial intelligence features which are reproduced in the course of development of dynamic expert system.

**Keywords:** testing, decision making system, artificial intelligence, dynamic expert system.