CONTENTS & ABSTRACTS

Kulinich A.A.

The new model of semiotic cognitive maps, based on principles of applied semiotics is suggested, representing a symbiosis of classical cognitive maps in the form of a cause-effect network (digraph) and a conceptual structure in the form of a qualitative conceptual framework — conceptual system — set of concepts of the subject domain connected by the relation «sort-kind». It is shown that the suggested model allows representing the set of semiotic cognitive maps of a subject domain as partially ordered set of signs: name, content and size, defining these cognitive maps. Suggested is the subject domain interpreting conceptual template construction algorithm, directed on supporting the processes of verification and interpretation of cause-effect relations in a subject domain, set by the cognitive map.

Keywords: cognitive map, cognitive modeling, sign, sign system, semiotics, applied semiotics, conceptual framework, conceptual system.

Breer V.V.

Models of tolerance are considered starting from the works of T. Shelling. It is shown, that tolerant threshold behavior, including the basic Shelling's model, could be equivalently transformed into the model of Granovetter with certain cumulative distribution function of thresholds. The model describing agents' competition inside a group with their sympathies outside of this group (a sort of «upside-down tolerance») is studied. These both types of behavior are explored in continuous time, additionally considering the effects of forgetting and delay leading to damped and undamped oscillations.

Keywords: tolerance, model of bounded neighborhood, Shelling's model, Granovetter's model.

Bure V.M., Parilina E.M., Sedakov A.A.

A model of opinion dynamics in a social network which also contains the two centers of influence is considered. Network members can influence each other, while the opinion dynamics is described by a time-homogeneous Markov chain. The possibility of reaching a consensus in the network is examined for two models of influence: either centers can directly influence each other or not. The parameters of the social network for reaching the consensus are found. When no consensus can be reached, the notion of a consensus of majority is introduced, obtaining the parameters of the network for reaching it. Theoretical results are illustrated with numerical examples.

Keywords: DeGroot model, influence, consensus, opinion dynamics.

Plyaskina N.I., Kharitonova V.N.

It can be noted, that today's structural reforms of real sector in Russian Federation increased the relevance of strategic management of complex multi-regional and multi-sector megaprojects, aimed to form the new infrastructure and industrial basis in Russia, development of natural resources of the Arctic and East regions of Russia, demanded on world markets. Pointed out is that problems of state management effectiveness and reconciliation of institutional stakeholders interests — private business, state and regions — come to the foreground. Suggested are the methodical approach and tools for complex interregional multi-sector megaprojects strategy development and their implementation management, based on program and target planning principles, institutional conditions variations modeling and state support mechanisms.

Keywords: investment project, megaproject, scenario, institutional conditions, strategic management, program and target planning, reconciliation of interests, state support, network model, imitation model, investment program.

Klochkov V.V., Cherner N.V.

The problem of rational use and development of the production potential of enterprises included into the integrated structures (mainly, state corporations) is considered. The methods to estimate the efficiency of managing the member companies' resources at the level of the integrated structure, including the use and development of individual productions' capacities, are suggested.

Keywords: integrated structures, production capacity, capacity utilization, bottlenecks, investment, development, efficiency, management, coordination, specialization.

Baybulatov A.A.

The method of calculation the guaranteed (maximum) modification time of software with prolonged iterative development process on the basis of «Network calculus» apparatus is presented. The calculations of the NPP APCS software maximum modification time at the stages of commissioning and operation for various modification techniques are conducted.

Keywords: modification time, software, «Network calculus», NPP.

Vedeshenkov V.A.

Proposed is the diagnosing organization, based on single verification test and 14 subsets of 4 additional tests for each «faulty» subsystem. The version of tests' subset constructing, providing the uniformity of the syndromes for testing components with the same numbers in any «faulty» subsystem, is suggested. The required diagnosing accuracy is ensured by the difference of test syndromes in any «faulty» subsystem. The example of using algebra-logical method for syndrome decoding is presented.

Keywords: digital system, minimal quasicomplete graph by dimension 7×7, component, test syndrome, «faulty» subsystem.

Novikov D.A.

The evolution of cybernetics is briefly considered; new stage of its development is introduced as «cybernetics 2.0» — a science of general regularities in systems' organization and control. Substantiated is the topicality of elaborating a new branch of cybernetics, i.e., organization theory (O^3) which studies an organization as a property, process and system.

Keywords: cybernetics, system, organization, control.

Glumov V.M, Krutova I.N., Sukhanov V.M.

Proposed are the equations of single-axis angular motion of the large space structure assembled in an orbit from separate elastic structural units. The parameters calculation procedure is given for discretely changing dynamic properties of structure assembled, which model has variable coefficients and distinct properties of elastic multi-frequency oscillatory system. Parametrically adjustable gyro-force attitude control algorithm is suggested to provide the desirable dynamics support at all stages of robotic assembly. The effectiveness of the algorithm is verified with computer simulation.

Keywords: large space structure, orbit assemblage, mathematical model, gyro-force attitude control, control algorithms.