# CONTENTS & ABSTRACTS

#### ON MOVING OBJECTS DEVIATION FROM DETECTION IN 2-D AND 3-D ..... 2

#### Abramyants T.G., Maslov E.P., Yakhno V.P.

The paper overviews the results of the problems of single and multiple targets deviation in 2-D and 3-D from a pursuer provided with a restricted detection zone. Evasion laws are derived as the solutions to optimization (for a single target) and game-theoretic (for a multiple target) problems.

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#### Novikov D.A.

The analysis of joint application of game-theory and cognitive maps in complex systems modeling is undertaken. For the integration of the both approaches, the problems arising in their intersection are classified and future research areas are systemized. A case study is included where a game on a linear cognitive map with initial step-function control is reduced to a classical normal form game.

# CONTROL FUNCTIONALS IN DELAY SYSTEM

## Sedova N.O.

The stabilization problem is considered for controlled systems governed by nonlinear functional differential equations with delays. The so-called control auxiliary functionals are used to construct a stabilizing control. The properties of these functionals enable to stabilize the system and sometimes to design stabilizing controls in the explicit form. «Inverse optimality» and robustness of the controls designed are also discussed.

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#### Schepetov A.G.

Optimal transient and frequency response curve shapes of an *n*-th order linear dynamics system are described. A modification of Vyshnegradsky diagram simplifying the equations of its domain boundaries is offered. A new diagram illustrating the dependency of third-order system's frequency response curve on system parameters is presented.

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#### Parsheva E.A.

A modified high order adaptation algorithm is offered for a multivariable object under parametric uncertainty with a delay in internal communication channel. Only measurable variables of local subsystems are used to create control impacts, i.e., the completely decentralized control is realized. The operability of the synthesized control systems under limited unmeasured disturbances is justified.

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#### Zhukov V.P.

The paper discusses the conditions under which the instability of equilibrium condition of nonautonomous linear systems of any order grades into instability of equilibrium condition of corresponding nonlinear perturbed systems under certain class nonlinear perturbations of their right-hand members (unstable nonautonomous linear system roughness in terms of stability type preservation). Sufficient conditions of such roughness are formulated for certain classes of nonlinear perturbations).

#### MANAGEMENT MECHANISMS

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## Tsyganov V.V., Kadymov D.S.

The mechanisms for managing political and economic systems under changing and uncertainty conditions are analyzed. The paper shows that the social production process results in periodically aggravating collisions of productive forces and production relations caused by coordination and liberalization problems of socio-economic systems. The paper concludes that these contradictions determine liberalization and centralization cycles in production relations resulting in the interchanging cycles of autonomism and liberalism in society.

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#### Kleparsky V.G., Kleparskaya Ek.V.

The paper identifies the critical role of adequate management (as a component of human capital) in process of ferrous metallurgy enterprises transition to intensive growth. An estimate of capitalized costs of management adequacy changes that took place in the first 2 years after the 1998 default is obtained.

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#### Shibaeva N.A.

The necessity of accounting and evaluation of the reproduction of human capital as a component of investment processes in human society is justified on the basis of the multifactorial economic growth theory. Authorial classification of the efficiency evaluation techniques is proposed. The expediency of applying optimally matched quantitative and qualitative criteria in evaluation techniques is shown.

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#### Popov E.V., Konovalov A.A.

The paper analyzes the problem of information retrieval transaction costs. The typology of information flows is presented along with the institutes and transaction costs of information production and consumption. A model of information retrieval costs optimization is developed.

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#### Ambartsumian A.A., Branishtov S.A.

The role of process regulations in industrial automation system design is discussed. A method for formal representation of information from the process regulations in order to develop a model of an active scenario of process, equipment and personnel control is proposed.

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#### Ponomarenko V.S., Listrovoy S.V.

A method for solving least cover and least vertex cover problems in arbitrary graphs enabling the construction of effective algorithms for calculating minimum cluster numbers is proposed. This enables the solution of a given subset of tasks in GRID with desirable efficiency.