



CONTROL SCIENCES

**Научно-технический
журнал**

6 номеров в год

ISSN 1819-3161

УЧРЕДИТЕЛЬ

**Институт проблем управления
им. В.А. Трапезникова РАН**

Главный редактор

Д.А. Новиков

**Заместители главного
редактора**

Л.П. Боровских, Ф.Ф. Пащенко

Редактор

Т.А. Гладкова

Выпускающий редактор

Л.В. Петракова

Издатель

ООО «СенСиДат-Контрол»

Адрес редакции
117997, ГСП-7, Москва,
ул. Профсоюзная, д. 65, к. 272.
Тел./факс (495) 334-92-00

E-mail: pu@ipu.ru
www.ipu.ru/period/ru

Оригинал-макет
и электронная версия
подготовлены
ООО «ЭЛЕКТРОНИНФОРМ»

Отпечатано с готовых диапозитивов
в типографии ГКС

Подписано в печать
3.05.2007 г.

Заказ № РВ307

Журнал зарегистрирован
в Министерстве
Российской Федерации
по делам печати,
телерадиовещания
и средств массовых
коммуникаций

Свидетельство о регистрации
ПИ №77-11963
от 06 марта 2002 г.

Журнал входит в Перечень ведущих
рецензируемых журналов и изданий,
в которых должны быть опубликованы
основные научные результаты
диссертаций на соискание ученой
степени доктора и кандидата наук

Подписные индексы:
81708 в каталоге Роспечати
38006 в объединенном каталоге
«Пресса России»

ПРОБЛЕМЫ УПРАВЛЕНИЯ

3.2007

СОДЕРЖАНИЕ

Обзоры

- Авдеева З.К., Коврига С.В., Макаренко Д.И., Максимов В.И. Когнитивный подход
в управлении 2

Управление в социально-экономических системах

- Алескеров Ф.Т., Андрюшина Н.А., Хуторская О.Е., Якуба В.И. Консультационная
система оценки удовлетворенности населения деятельностью администрации
региона 9
- Воробьева Т.В. Модель устойчивого экономического роста 14
- Гусев В.Б. Равновесные модели многоресурсных саморазвивающихся систем 18
- Власова М.А. Модель прогнозно-программного комплекса для оценки альтерна-
тивных инвестиционных стратегий государства 25
- Вересников Г.С. Идентификация экологических ситуаций в процессе экологического
мониторинга 30

Управление технологическими процессами

- Амбарцумян А.А. НЕР-системы управления технологическими процессами —
новый тип систем, ориентированный на технологическую безопасность и защиту
от ошибок персонала 35
- Кузнецов Л.А. Управление качеством в сложных технологических процессах 47

Информационные технологии в управлении

- Жожикашвили В.А., Билик Р.В., Троценко А.Ю. и др. Интеграция систем
массового обслуживания на основе речевых технологий и web-сервисов 54
- Чобану М.К. Системы многоскоростной обработки многомерных сигналов. Ч. II 58

Краткие сообщения

- Афанасьева К.Е., Ширяев В.И. Идентификация состояния и прогнозирование
регионального рынка 63
- Спиро А.Г. Цифровая индикация особых фигур на графиках одного вида представ-
ления котировок акций фондового рынка 66

Письма в редакцию

- Эштейн В.Л. О контрпродуктивности использования наукометрического показателя
результативности научной деятельности для будущего России 70

Хроника

- XIV международная конференция «Проблемы управления безопасностью
сложных систем» 73

* * *

- Contents & abstracts 76



CONTENTS & ABSTRACTS

COGNITIVE APPROACH IN CONTROL Avdeeva Z. K., Kovriga S. V., Makarenko D. I., Maximov V. I.

The cognitive approach in simulation and control is briefly overviewed. A class of control problems is identified where the application of cognitive simulation is justified. Basic definitions are made. A method for developing the strategies of weakly structured problem solution based on cognitive models as applied to socio-economic system is presented. Some cognitive approach development lines are shown.

A SYSTEM FOR EVALUATING CITIZENS' SATISFACTION WITH REGIONAL ADMINISTRATION Aleskerov F. T., Andrushina N. A., Khutorskaya O. Ye., Yakuba V. I.

A computerized system for estimating citizens' satisfaction with regional administration is presented. The system includes the following models: individual's behavior, threshold aggregation, indices interaction, factor analysis, and disproportional development. The system allows to reveal the citizens' satisfaction with the regional administration based on the set of life quality parameters without using any regular public opinion polls.

A MODEL OF SUSTAINABLE ECONOMIC GROWTH Vorobyova T. V.

An economic growth model modifying the Solow model is proposed. The modified model considers the natural capital and the generalized savings rate including the expenditure for natural capital reproduction. The generalized savings rate value optimal with respect to the criterion of average consumption per capita is derived as well as the savings rate for capital assets development.

EQUILIBRIUM MODELS OF MULTI-RESOURCE SELF-DEVELOPING SYSTEMS Gusev V. B.

A method for analyzing the balanced structure of production cycle's control parameters on the basis of cost estimate schemes in a multi-resource self-developing system model is proposed. The paper notes that, in the long term, the balanced control meets the optimality criterion for the resource reproduction factor in a multi-product manufacturing system and brings the system to the equilibrium state. The method proposed can be included into an index-based planning toolkit for large-scale economical objects from a holding up to the national economy.

A PREDICTIVE MODEL FOR EVALUATING ALTERNATIVE NATIONAL INVESTMENT STRATEGIES Vlasova M. A.

A predictive model enabling the analysis of alternative national strategies for minimizing external environmental uncertainty factor is developed.

EVENT IDENTIFICATION IN ENVIRONMENTAL MONITORING PROCESS Veresnikov G. S.

An approach to building an environmental event identification module for operative decision-making support is proposed. A methodology for building a representative sample necessary for the module development is described.

HEP PROCESS CONTROL SYSTEMS: A NEW SYSTEM TYPE FOR PROCESS SAFETY AND HUMAN ERROR PROTECTION Amabrtsumyan A. A.

Design concepts of process control systems tolerant to operating staff's errors are formulated. A control scheme is proposed based on an enhanced event model of automated manufacture including «process network» and «processes» models and active process scenarios. The latter combined with event models enable new opportunities for process control automation, such as process operation procedure management, automated personnel activities management

and supervision, in-situ coordination of services and works, control levels differentiation through personalization of interfaces.

QUALITY MANAGEMENT IN COMPLEX PROCESSES Kuznetsov L. A.

An approach to complex process quality management is described. The entropy is offered for evaluating the technology status and product quality described by the measured values of process variables and quality specifications and for the quality indices described by stochastic variables, while the amount of information can be used for identifying the relationship between the technology and the quality. Two technologies are considered: the local one is related with the product unit, while the global one restrains its definitional domain. A self-learning quality control system is developed.

INTEGRATION OF INFORMATION AND SERVICES SYSTEMS ON THE BASE OF SPEECH TECHNOLOGIES AND WEB-SERVICES Zhzhikashvili V. A., Bilik R. V., Troschenko A. U., et al.

The paper reviews speech recognition and synthesis technologies and their applications in queuing systems as well web-service technology developed for service-oriented architecture implementation. Next generation architecture for queuing systems with intelligent services is offered.

MULTIRATE SYSTEMS FOR MULTIDIMENSIONAL SIGNAL PROCESSING. PART II Tchobanou M. K.

The methods for polynomial synthesis of multidimensional non-separable multirate systems are considered. Basic requirements to be met by synthesized digital filters are proposed. Three main approaches to the synthesis are proposed. They are based on the application of Bernstein polynomials, lifting technique, and matrix completion method.

REGIONAL MARKET STATE IDENTIFICATION AND PREDICTION Afanasyeva K. E., Shiryaev V. I.

The problem of regional markets modeling is examined with the purpose of establishing general rules in regional market trends and building a forecast. An identification algorithm for model parameters and regional market state is proposed taking into account the information about the trajectories of similar («related») markets under changing regional market trends.

DIGITAL IDENTIFICATION OF SINGULAR FIGURES ON THE GRAPHS OF A VIDEO PICTURE OF STOCK MARKET QUOTATIONS Spiro A. G.

A digital indication technique is offered for singular figures arising at the changes of stock market prices development curve represented by the graphs of so-called «Japanese candles». The technique allows to digitize these figures that show with some probability the changes in stock prices.

ON THE COUNTER-PRODUCTIVITY OF APPLYING SCIENCE-METERING INDICATOR OF SCIENCE EFFECTIVENESS FOR THE FUTURE OF RUSSIA Epstein V. L.

The paper predicts the need in a new «pragmatic» paradigm of scientific publications and argues for the thesis that the application of science-metering indicator of science effectiveness contradicts the strategy towards competitive innovative Russian economy. Instead, the paper suggests to organize innovation-oriented management in the national segment of domestic science.

XIV INTERNATIONAL CONFERENCE «THE PROBLEMS OF COMPOUND SYSTEMS SAFETY MANAGEMENT» 73