CONTENTS & ABSTRACTS

V.A. Kubyshkin, S.S. Postnov

The optimal control problem of two kinds investigated for pendulum of fractional order in case when admissible control search evaluated in space of functions which are quadratic integrable on the segment. The first kind of problem is to search control which passes the system in given state with minimal control norm at given control time. The second one is to search control which passes the system in given state with minimal control time at given control norm restriction. It is shown that both of these problems can be reduced to the problem of moments. For the last problem the conditions derived which define possibility of statement and solvability. Explicit solution for optimal control problem obtained analytically. Computational experiments evaluated and dependencies of control norm and minimal transition time from order of fractional derivative investigated. Also qualitative dynamics of investigated system studied: boundaries of integral funnel and phase trajectories in optimal control mode calculated.

Keywords: optimal control, problem of moments, pendulum, Caputo fractional derivative.

E.M. Bronshtein, A.A. Davletbaev

The problem of constructing a cyclic route with minimal transport cost for delivering a homogeneous cargo from a set of producers to consumers by limited capacity vehicle is considered. It is assumed that the cost of transportation between points depends on time. The corresponding integer linear model is constructed. Computer experiments were carried out.

Keywords: routing, nonstationarity, linear integer programming, branchs and cuts method.

L.P. Zen'kova

The issues of economic system control under cyclicity of development are considered. The comparative analysis of conceptual approaches to techniques of revealing the leading indicators of business cycle for transformation economies is given. The necessity of the specified indicators ranging both for short and medium term cycles is proven. The results of revealing the leading indicators for Bulgaria, Byelorussia, Russia, and Ukraine on the basis of processing of extensive statistical base with use of author's methodology are presented.

Keywords: business cycle, transformation economy, leading indicator, phases of a cycle, dating of phases, rotary zone.

M.I. Geraskin, D.A. Kvashin

The problem of optimization of state social investment in «Education», «Health», «Accessible and comfortable flats» projects realized in Russia during 2006—2012 is examined. The complex of multifactor regression optimization models of social projects investment distribution is developed. The multicriteria optimization mechanisms of project financing for equal priority and non equal priority criteria are developed. The optimization problem of investment plans for 2013—2015 years period is solved through criteria and indicators of social projects, optimized prognoses of social sphere dynamics of Samara region are formed.

Keywords: state social investment, multifactor regression, mixed project financing, mechanisms of multicriteria optimization.

S.V. Sigova, N.V. Parikova

The paper deals with a complicated socio-economic phenomenon — foreign labor migration. Positive and negative effects of migration on the Russian economy are analyzed. Quantitative indicators for evaluation of foreign labour migration impact both on pressure issues from regional labor market perspective and demand in vocational education and training are proposed. This resulted in basic algorithm for foreign labour migration process administration.

Keywords: foreign labour migration, impact of migration on the economy, demand of the economy for workers, migration process administration, migration policy.

A.N. Sorokina, A.Ya. Chervonenkis

In the author's previous paper optimization algorithm of ads allocation in Sponsored Search was proposed. This paper presents modernization of the algorithm. The proof of the equivalence of the old and the improved algorithm is given. There is a significant reduction in the enumerations and performing operations in new algorithm. Experimental results of the new algorithm using real data sets provided by «Yandex» company are presented.

Keyworlds: ads CTR, on-line advertising, optimization of ads allocation, optimizational algorithm constructing.

S.V. Artyschenko, P.A. Golovinski

Channel representation of data to decode the broadband signal is proposed. The basis of the approach is non-linear map, which increases the dimensionality of data and the distance between patterns. Final signal detection is carried out using complex-valued quantum neurons in a parallel circuit. The efficiency of the algorithm for decoding of a signal with the background of white noise is shown.

Keywords: broadband signal, decoding, channel encoding, quantum neuron, white noise.

N.I. Eliseev, O.A. Finko

The paper presents the structure of subsystem of incoming information quality control which allows to extend the functionality of the modern electronic document management systems. The improved algorithm for generation and verification of electronic signatures providing new properties for documents is proposed.

Keywords: electronic document management system, electronic signature, quality of information, legal significance of the information.