CONTENTS & ABSTRACTS

Makarenko A.V.

The measure is proposed of discrete real sequences similarity in the extended space of states. The measure is based on the symbolic CTQ-analysis methods and is applicable to a chaotic and stochastic multidimensional non-equidistant time series as well. The analysis of the proposed metrics is carried out and their basic properties are described. The method efficiency is tested on the model systems differing in complexity and topology of the attractor. The high sensitivity of the developed similarity measures is demonstrated on the example of the financial time series analysis.

Keywords: discrete sequences, T-alphabet, metric set, symbolic analysis, financial time series, Rossler oscillator.

BRIDGE CRANE TROLLEY MOVEMENT

| IN THE ANTI-SWAY | MODE |
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Korytov M.S.

The sequence of one-parametric optimization problems is solved to find the load suspension point program control for the bridge crane in a problem of terminal targeting. The problem of swaying is considered for the load moved with the bridge crane. The way is suggested to solve the problem of moving the bridge crane trolley for a predetermined distance, providing the complete suppression of uncontrolled pendulum spatial swaying of the load on the rope suspension. The principle is applied of recalculating the time dependence of angles of a hoisting rope deviation from the vertical depending on accelerations, speeds and movements of the load suspension point on the trolley. Kinematic restrictions on load suspension point movements are taken into account in the form of the maximally attainable accelerations and speeds of the crane bridge and trolley.

Keywords: bridge crane, load trajectory, sway damping, swaying.

CONCILIATIVE SOLUTIONS FOR MULTICRITERIAL

Podinovski V.V.

A new approach is proposed to define the conciliation (surrogate) solution conception for the problem of selecting the best alternative from a finite set of alternatives with the parametric model of preferences. The concept of maximum likelihood optimal (ml-optimal) alternatives is suggested. The ways of finding such alternatives are shown for the multicriterial problems with models of preferences based on value functions or binary relations.

Keywords: multicriterial decision making problems, partial information about preferences, surrogate weights of criteria.

Geraskin M.I.

The development problem of the optimal on aggregate utility criterion effect distribution mechanism is considered in strongly connected system of agents, allowing the utility transfer in the form of agents' profit. For integrated agents' system with complementary demand functions obtained are the conditions of synergetic effect generation, and the form of optimal mechanism is suggested, satisfying the conditions of workability, balance, and stimulus compatibility. The numerical simulation for the «retailer — bank—insurer» system has proved the mechanism stability to strategic behaviour of agents.

Keywords: distribution mechanism, strongly connected system, anonymous agent, aggregate utility, complementary demand, transferable utility, Nash equilibrium, retailer, bank, insurer.

Kurako E.A., Orlov V.L.

The concept of object-associated document flow is introduced. The connection is show between documents and objects' state changes. The model of object-associated document flow design is suggested. Principles are formulated of information systems design on the basis of object-associated document flow.

Keywords: document flow, object-associated document flow, business processes, web services, information systems.

| USING INTERVAL NEURAL NETWORK PREDICTION | |
|--|------|
| FOR MEASURING INSTRUMENTS CALIBRATION | |
| IN CONTROL SYSTEMS | . 50 |

Saraev P.V., Polozova Y.E., Polozov Y.L.

The possibility is analyzed of using neural network prediction results for calibrating the measuring instruments, being the part of control systems. The modification of quality functional is given and the use of the interval global optimization algorithm is suggested for interval neural network models training. The developed software is described in brief. Considered are the calibration technique and the measurement procedure of determining the interval neural network prediction applicability. The results of computing experiments are given.

Keywords: interval neural network, neural network prediction, calibration of measuring instruments.

Syrov A.S., Rutkovsky V.Yu., Glumov V.M., et. al.

The main features of attitude stabilization system are considered that are necessary to take into account when designing the full automatic vehicle control system. The details of adaptation algorithms realization are defined that are ignored in the adaptive system analytic synthesis. The problem is solved of providing the control signals constraints at their kinematic decoupling for the vehicles with three control surfaces. The analytical algorithm is given of angle of attack evaluating during the flight.

Keywords: unmanned aerial vehicle, move away from carrier, mathematical model, attitude stabilization, control algorithm, control and stabilization systems, criterion, sensitivity function.

MAGNETIC GRADIOMETRY APPLICATION FOR THE MOVING OBJECT MAGNETIC FIELD CONTROL68

Volkovitskiy A.K., Karshakov E.V., Tkhorenko M.Yu., Pavlov B.V.

The problem is considered of the moving object magnetic field control with the use of the onboard magnetic gradiometer sensors in order to minimize the magnetic influence of the object. It is suggested to solve this problem using the onboard magnetic dipoles by altering their dipole moments. To form the feedback signal in the magnetic field control loop two magnetic gradiometers should be used, installed at different distances from the carrier body. Two methods of controlling are considered. One of them uses the difference between gradiometers' readings, taking their known mutual position into account. Another is based on assumption of negligible object influence on large distances, that allows to evaluate the external magnetic field using the farther magnetic gradiometer.

Keywords: magnetic gradiometry, SQUID, degaussing.

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